



HOW TO STUDY

AND

WHAT TO STUDY

BY

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HIGHLAND PARK, ILLINOIS

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PART I

THE PRINCIPLES OF EFFECTIVE
STUDY

FOREWORD TO PART I

It is my belief that students have a right to as much and as expert coaching on how to study lessons from books as they receive on how to play football, how to dance, or how to do anything else. They will generally be grateful for such help. In fact, the learning process may be made the subject of so much thought as to become itself a vital interest, perhaps as potent in holding students in school as are the extra-scholastic activities, such as games, dramatics, initiations, and the like, that are seemingly the only attractions in school and college life for many young people. My classes have found help in the talks that I have given as I have kept pace with the slowly developing literature of educational psychology.

The purpose of this little book is to place before younger students, in simple form, the general principles of effective study; if it helps its readers, it will have fulfilled its mission.

The authors starred below read the greater part of this book when in manuscript form and helped me with criticisms, suggestions, and encouragement.

AUTHORITIES

The Psychology of High School Subjects. . Charles H. Judd *

The Learning Process Stephen Sheldon Colvin *

The Principles of Teaching Based on Psychology
. Edward L. Thorndike

A Brief Course in the Teaching Process. . . . Geo. D. Strayer

The Educative Process.....	Wm. Chandler Bagley *
The Economy and Training of Memory.....	Henry J. Watt
Introduction to Experimental Education....	Robert R. Rusk
Manual of Mental and Physical Tests.....	G. M. Whipple
The Psychology of Adolescence.....	G. Stanley Hall
Attention and Interest.....	Felix Arnold
Interest in its Relation to Pedagogy.....	Wilhelm Ostermann
Interest and Education.....	Charles De Garmo
The Individual in the Making.....	E. A. Kirkpatrick
Genetic Philosophy of Education.....	G. E. Partridge
Studies in Logical Theory.....	John Dewey
The Basis of Practical Teaching.....	Elmer Barrett Bryan
Principles of Educational Practice.....	Paul Klapper
The Principles of Education.....	W. Franklin Jones
How to Study and Teaching How to Study..	F. M. McMurry *
High School Education.....	Charles H. Johnston and Others
The High School Age.....	Irving King
Psychology.....	William James
Increasing Human Efficiency in Business...	Walter Dill Scott
Mental Fatigue.....	Dr. Max Offner
Mental Fatigue.....	Tsuro Arai
La Fatigue et le Repos.....	Dr. Ferdinand LaGrange
Food and Dietetics.....	Robert Hutchison, M. D.
Educational Values.....	Wm. Chandler Bagley *
The Hygiene of the Mind.....	Thomas Smith Clouston
Psychology.....	Charles H. Judd *

THE PRINCIPLES OF EFFECTIVE STUDY

I. KNOW THAT YOUR WORK IS WORTH DOING

No great and enduring work will ever be done when the heart is not in it. The harder the work the more clearly true is the statement. It is true of study; and study for young minds is hard work. There must be interest of some sort in study, as in everything else, or it cannot be continued by rational human beings. The will cannot focus attention upon any subject that lacks interest for more than *a few seconds at a time*; and forced attention requires too great expenditure of energy. School work must of necessity be hard for the normal young mind. Every subject of instruction is to him a new field of thought. Later in life, when knowledge has been acquired along many different lines, the acquired knowledge develops centres of interest that attract and hold the attention; but the youth, seeing no such relations, knows little or nothing about the subject matter to which he begins to devote his time and hence launches himself into the new work with great effort.

Intellectual
work diffi-
cult.

In order to make a hearty effort you must think of all the good reasons for study that you can find, and must control all inclination toward idleness

Need of
right emo-
tional tone

or pleasure. A great deal depends upon your emotional tone. The right emotional tone is a happy-earnest feeling toward your work. You will attain this in proportion as you respect and value your studies.

Easy to see
the advantage
of
learning.

Fortunately it requires only a little serious thought to make the average young man or woman realize the importance of study. So apparent is the advantage of education that even the uneducated can realize it; and often the cry goes up from those who come to their senses too late, "Oh, why did I not devote more time to study at an age when I had the leisure for it!"

Wealth de-
voted to
higher edu-
cation.

A proof of what the general public thinks of high school and university education is the amount of money voted in public taxes to support it. This amount increases by leaps and bounds. In 1912-13 more than \$59,000,000 was raised by taxation to support public high schools; and \$212,582 from public appropriations, besides \$11,484,000 from other sources, was spent in maintaining private schools of the same grade. Consider also, in addition to the public taxes, the gifts and benefactions from private individuals who decide that the best way in which their money can do good is by providing opportunities for the young to study and secure education. In 1912-13, \$25,000,000 was bestowed for this purpose on colleges and universities. For the same year there were 1,283,009 students in public and private high schools and over 200,000 in colleges. The foregoing figures do not include the students in evening schools, business

colleges, normal schools, and other professional schools and special institutions.

All this wealth, devoted to study, and all this army of students who have passed the years of compulsory education are very significant facts; they can have but one meaning: *the enormous value put upon the work of schools and colleges — in other words, upon STUDY.* For in the last analysis *there is no such thing as education without study and effort* on the part of the one who is being educated.

Shows value
put upon it.

If this array of figures appeals only to the intellect and still leaves you cold toward your actual work, take a little time to think what study will do for you. It will make possible to you the highest, happiest life, fullest in understanding and in rich human experiences. With study, your interests, now so narrow, will widen in every direction. All that surrounds you, both near and far, — the world of nature, the earth, plants and animals, the past, the present, yes, even the future, — will be filled with significance; and you will become alive to a thousand things to which now you are dead. What interest has a child in the tombs of the Pharaohs, in the atomic theory, or in Mendel's law? What interest have you in these things if you never studied them? "Not to have studied," said Cicero two thousand years ago, "is to remain always a child."

Education
widens the
interests and
promotes
happiness.

Power, position, reputation, and honor are all within the grasp of the diligent student. This is as true today as it was when Solomon wrote, a thousand years before Christ, "Happy is the man that findeth wisdom, and the man that getteth

It increases
one's possi-
bilities in
life.

understanding. . . . Length of days is in her right hand, in her left hand riches and honor."

In order to get the right attitude toward school work you should have by you a book or two of short biographical sketches that show how success has been won. Smiles's *Selfhelp* and the *Proverbs* have stimulated many a man of an earlier time to stick to his books. Students have found Orison Swett Marden's inspirational books valuable, especially his *Pushing to the Front*. These books are full of examples of men who, under trying circumstances, often without school or teacher, in a narrow margin of leisure time have acquired rich stores of knowledge by use of which they have risen to distinction.

To himself, the efforts of the average student seem paltry and feeble when he reads Milton's words, "From the twelfth year of my age I scarcely ever went from my lessons to bed before midnight;" or when he pictures to himself Abraham Lincoln stretched by the firelight, working out the problems of geometry — a self-imposed task; or when he reads of Cobden, the poor clerk, rising early to study while his companions slept, and laying the foundation of that eminence to which Bright referred when he said, "There is not in Great Britain a poor man's home that has not a bigger, better, and cheaper loaf through Richard Cobden's efforts." Read Elihu Burritt's diary and know what effort is: "Monday, June 18, headache, 40 pages Cuvier's *Theory of the Earth*, 64 pages French, 11 hours forging. Tuesday, June 19, 60 lines Hebrew, 30 lines Danish, 10 lines Bohemian, 9 lines Polish, 15 names of stars,

Value of inspirational books to the student.

Value of biography.

10 hours forging." Is it strange that Elihu Burritt became distinguished as an eminent lecturer and philanthropist? It was he who organized the first international Peace Congress and to his efforts are traced the Geneva Tribunal and the Paris Bering Sea Tribunal. Such biography is fit to put "pep," if possible, into the studies of a half-wit; certainly it should help to make scholars of dullards.

If there are any who are unwilling to work for their own selfish advancement, they should consider the increased power for service to others which such self-advancement gives. Those students whose pride is not self-centered must still rejoice to see how grade-marks, symbolizing their scholastic success in competition with other young people, gladden the hearts of those at home. Mother's and father's eyes brighten, and brothers and sisters are glad because the student of the family has won distinction. Young and old instinctively know that industry and intelligence are indications of good stock in which they, too, have a share; and all are in consequence heartened and cheered. "There will be a strong man in the family," parents say, "when years of weak old age come upon us."

Scholarship
a sign of
good stock.

The most unselfish can see in study an opportunity to serve their country. We delight to honor courage, but it is questionable whether the most distinguished services of our country's generals are to be compared with the services of her scholars. Think what has been accomplished by German scholarship, vigorous and thorough. History is very clear on this—that Germany's preëminence in

Scholarship
and patri-
otism.

so many lines of industry is the result of German scholarship. If America is to hold her place even in industry, she must have scholars and scientists of the same thorough-going stamp to lead the way to discovery and invention.

Value of
good repu-
tations
among
classmates.

It is no small thing to make a reputation for ability among one's classmates. In most instances there will never again be such an opportunity to acquire so easily a reputation for ability, intelligence, and industry. Where could one find a better chance to show his worth before so many? These classmates of today will be the men and women of tomorrow; and what they say of you can make or mar your success in the days to come. If with good scholarship go bigness of heart and unselfish devotion to common interests, you will have many eager helpers all along your upward path — old schoolmates and college friends, who have recognized your worth.

Commercial
value of
school repu-
tations.

It is of no less importance to make a good record in the eyes of your instructors. Especially when you first start in business life, employers will inquire what your school record is. The more important the position to which you aspire and the more trust to be placed in you, the more will your record be searched. On the following page is a form that I have filled out scores of times for young men seeking positions of responsibility. Notice how much stress is upon their school record.

THE FIDELITY AND CASUALTY COMPANY OF NEW YORK

97 Cedar Street, New York City

Fidelity Department: EDWARD C. HUNT, Superintendent

Dear Sir:

Mr....., age....., of.....
 son or ward of Mr....., of.....,
 has applied to this company for a bond of suretyship in the
 sum of \$..... as..... in the service of.....
 Since it appears from his application that he attended

..... school from, to
 under

I beg leave to ask the favor of full and candid replies to the
 following questions. Your answers will be deemed strictly
 confidential and will, of course, involve you in no pecuniary
 responsibility.

Yours respectfully,

.....

1. Are the foregoing dates correct according to your
 records? If not, what are the correct dates?

2. Do your records, or your personal knowledge, warrant
 you in recommending the applicant for

a. Attention to studies?

b. Good conduct?

c. Punctuality?

d. Ability?

3. Have you ever known or heard of any dishonorable action
 on his part? If so, give particulars.....

4. Have you ever known or heard at any time of his using
 intoxicants to excess? If so, please state about how long
 ago.....

5. Have you ever known of his having been addicted to any
 bad habits? If so, what?

6. From your acquaintance with him or his antecedents,
 do you deem him entirely trustworthy?

7. Where and by whom has he been employed or engaged since you have known him?

8. Are you acquainted with the applicant's home or domestic conditions? If so, please state where he has been residing, giving any information you may have of his immediate family surroundings.

The information hereon is given in confidence and no pecuniary responsibility is assumed by the undersigned.

Signature..... Business or occupation.....

Date..... Address

The education of a savage.

The most convincing proof of the value of education that I have ever known came to me in an address by Doctor Carlos Montezuma before a men's club in Chicago. Doctor Montezuma is a full-blooded Apache Indian who was captured, when a child, from an Indian village in Arizona and who continued to be held as a slave long after negro slavery ceased in the South. With singular vividness and charm he told the story of this early episode and of his subsequent life: how he was sold for thirty dollars to a Chicago artist who happened to be traveling on the frontier; how he was brought East and sent to school; how he, formerly a nameless young savage, passed through the grades of the elementary and high schools, entered college, and, after graduating there, finished a course of medicine in a professional school.

He meets his step-mother.

The government at Washington then engaged his services to visit the western tribes and report upon their condition. He visited, among others, the very tribe from which as a boy he had been taken captive. There he found his people still living

under primitive conditions in the wretched little grass-thatched huts that he had known in childhood. His attention was called to an Indian woman, dirty and unkempt, who was cooking at a fire of sticks before her hut, amid a swarm of flies. From the height of his superior education gained in the white man's schools, he gazed upon her. Outwardly he saw that she was unclean; and he knew that within she was the prey to fears and dark superstitions—the ignorant victim of her unsanitary surroundings. She was so wretched an object to look upon, evidently so lacking in feminine tastes and cultured feelings, that as he stood there he found himself wondering *whether this woman had a soul*.

Presently he learned that she was his own step-mother. Then a feeling of pity for his people, such as he had not known before, came over him. He realized at once that their highest good could be attained only by their entering into the culture of the whites, by learning as he had learned the lessons of civilization taught in their schools.

Doctor Montezuma ended the address with a plea that the Indian reservations be abolished, that their lazy, idle life at government expense cease; that they be no longer segregated, but that their children be put into school side by side with the white children, where they could get from books and studies and teachers the experience of past ages with which to regulate their conduct and ennoble their lives.

The speaker was a typical Indian of the far West, squat of stature, with high cheek bones, swarthy

He realizes the advantages of the white man's schools.

What edu-
cation has
done for
him.

complexion, and coarse, thatch-like hair. As he spoke, the wonder of it came to us again and again. Instead of the guttural Indian tongue, scant in vocabulary and pieced out with signs and gestures, he used the most cultured English, enriched as it is by additions from the noblest languages of ancient and modern Europe. It was a distinguished audience that he addressed, representing many of the best families of a wealthy residence district; but it is doubtful whether one of his hearers could have spoken better than he. They marvelled to see what education had done for him. His body was probably little different from what it would have been if he had remained in his primitive home. But his mind and soul — how different were they! How different his outlook on life, his attitude toward the world, his sympathies, tastes, and prejudices! With his scientific studies, there had come to this Indian physician a love of demonstrable truth that made ridiculous the *hocus pocus* of the medicine man of his native tribe.

He might have said with Tennyson's Ulysses, "I am a part of all that I have met." He had met in his books the master minds of all time; and into his soul their thoughts and feelings had passed. Perhaps it was in spite of himself that the lessons in sanitation, learned in school and in hospital, had so changed him as to make the filth of an Indian camp disgusting. Perhaps some of the tenderness of Gray and Burns and Goldsmith had made Indian cruelty a hateful thing. Perhaps the songs of Mendelssohn and Schubert and the orchestrations

of Wagner had taught a nobler enjoyment than that afforded by *tom-tom* and shouting. He had seen the effect of training in the use of material things: as when architect and builder have learned to erect dwellings that make the tepee look like the abode of animals, or at least like the play-house of children. He had seen how, as the result of study, men are talking through vast reaches of space, harnessing the cataract to do their work, and flying on the wings of the wind. It is not strange that he wanted the gifts of education for his people. It is said that three generations without schools and without teachers would put us all back into savagery.

It is worth while to think sometimes of such things; we are so used to schools and education that we forget how much they mean to us.

As a student, know that your work is worth doing. Summary.

Think of all the good reasons you have for studying: your own highest interest, your home, your country.

Read the authors and biographies that emphasize these truths; and avoid every suggestion contrary to their teachings.

II. HAVE CONFIDENCE THAT YOU CAN DO IT

Enfeebling
effect of dis-
pleasure and
despair.

Not only must you gain the full consent of your mind to the proposition that your work as a student is worth doing, — *you must also have confidence that you can do it*. Remember: the right emotional tone is one of happy-earnest *confidence*. If you know that your work is well worth doing you cannot dislike it. If you know that you can do it, you cannot despair of it. Enormous energy has to be spent in studying what one dislikes or despairs of acquiring. Displeasure depresses and exhausts. The brow contracts, the shoulders draw together, the corners of the mouth drop down, the whole form stoops, the hands close, and the arms bend into a more or less defensive attitude. In that position the body is on guard, as it were; shut up, so far as may be, to outside influence. The mind follows the body. In such a condition of mind and body, learning is almost impossible.

Invigorat-
ing effect of
hope and
pleasure.

But the right emotional tone of happy-earnest confidence smooths out the wrinkles in the brow, lifts the corners of the mouth, opens the chest to deep breathing and strong heart action. The whole body becomes receptive. The mind is then alert and ready to receive suggestion and stimulation.¹

Now the question is, how may we acquire this confidence? Lincoln sustained himself in the years

¹ See Scott's *Increasing Human Efficiency in Business*, p. 182.

of self-directed study with the belief, "What man has done before, man can do again." It is a sustaining thought for you. Generations of students have mastered this mathematics, this Latin, this physics, over which you sigh. Others in a thousand schools are mastering these studies today. Perhaps in your class are others far less equipped than you with energy and endurance to bear the stress of mental work. What all these have done and are doing successfully you can do.

Confidence gained by the thought of others' success.

Not only should the thought of others encourage you, but the place that you have already reached in education should prove to you that you are no defective. Have you won that place by sheer force of industry? Then so much the greater must be your deserved self-reliance. Hard-won success breeds ever the best and sturdiest confidence. The race is not always to the swift. Remember that Grant was a mediocre student and Wellington slow to learn. Perhaps the persistency which slow minds must develop to hold a place in school more than makes up for the lack of brilliance and quickness of intellect.

By the thought of your own hard-won success.

Lack of money need not daunt the student. Scholarship thrives best on plain fare. After a dinner of cornmeal and milk, no sleepy dullness follows, such as halts the studies of the overfed. Never was it so easy for the poor to acquire an education. Thousands are working their way through high schools and colleges. Many earn every cent it costs them.

Indigence no bar to scholarship.

What others are doing you can do. Only do not

Advice to
those who
work their
way.

think you must carry full work while you earn your way. Sometimes young people attempt the impracticable, and are disappointed at failures that were inevitable. If necessary, take five or six years to carry a four-years' course. Then you will have no difficulty in holding a good rank in scholarship.

Advice to
those who
learn with
difficulty.

In urging you to have confidence, I would not have it understood that you are urged to take more work than you can do well. Just as one does not thrive physically by overeating, so no one can thrive mentally by trying to take in more mental food than he can make a part of his thinking. There is a wide difference in the power of individuals to assimilate learning, just as in their power to assimilate food. Physical differences are easily recognized by young people. They readily see that one of their number is six feet two in height, while another is barely five feet. They see that one young man can easily throw an iron ball forty-five feet, while another of the same age cannot throw it twenty feet, though he tries ever so hard. But young people are slow to recognize mental differences. They usually ascribe differences in marks to differences in effort or in previous study, or to some external circumstance. The lock-step of the grades fosters this belief; and especially the fact that effort there usually counts for as much as actual accomplishment in securing promotion from grade to grade.

Even while urging you to have confidence, I would also urge you to become acquainted with your own

limitations. Know yourself. Thus only can your confidence be sane and enduring. Just as there are boys who can put the shot forty feet as easily as others put it twenty, so there may be one student who can carry five subjects with no more effort than another must put forth to carry three. If you belong to the small group that can do no more than three studies well, accept that fact and do not try to carry more. Unfortunately, from a false sense of pride or a desire to graduate with a certain class, many students stagger under too heavy a load. They may manage to pass; but the work is not learned with enough thoroughness to make it a part of their mental equipment. Too little of it ever becomes the subject of thought afterward; in fact, it may be done in so feeble a way that it contributes practically nothing to the happiness or efficiency of the student.

"Beware of a man of one book," says the proverb, meaning that such a man proves a more dangerous opponent than the man who has but a hazy knowledge in many directions. Specialize; devote your time and energies to a narrow field of endeavor and you will do much, even if you are not a mental Hercules.

Not even weak health need stand in the way of intellectual conquest. Wonderful success has been achieved by men in feeble health. Take Parkman, Stevenson, and Pope as examples. Francis Parkman, our most distinguished historian, continued to work when too weak to apply himself for more than five minutes at a time, patiently gathering material

A little thoroughly learned rather than much hazy knowledge.

Advantage of specialization.

Weak health no bar to scholarship.

and writing out or dictating those fascinating histories, volume after volume, on the French in the New World. Robert Louis Stevenson wrote much in bed, too sick to sit up. Pope was so frail that he could not sit at his desk without a bandage to hold his weak body erect. Good hope and confidence rise superior to all ills. Nothing could daunt the spirit of these men. It cannot be proved that the life of one of them was cut short a day by his intellectual exertions. Success is a medicine that often more than cures every pain that accompanies hard work.

Summary.

Have confidence!

Lack of money, ill health, slowness of intellect have been no barriers to great achievement in the case of others.

Think of what you have already won; open your mind to the rich world of thought still before you and have confidence that you can conquer it.

Undertake no impossible task.

Try to do what is reasonable; and with happy-earnest confidence, go forward and do it.

III. HAVE FIXED HOURS FOR STUDY AND PLUNGE IN WHEN THE HOUR COMES

Nothing can be more helpful to the student than to set certain definite hours for the preparation of definite studies. If hours are fixed, habit steps in and makes it easy to begin the task at the appointed time. In fact, if the habit is kept up long enough, study will be easier, when the study hour comes, than anything else. On the other hand, the student who has no fixed program of study outside of class wastes every day an enormous amount of time and energy getting himself launched in his work, and he always risks being inadequately prepared. This statement is true of all students, and especially of the young, who still find mental work irksome.

Effect of
habit to
make study
easy.

William James says, "There is no more miserable human being than one in whom nothing is habitual but indecision, and for whom the lighting of every cigar, the drinking of every cup, the time of rising and going to bed every day, and the beginning of every bit of work, are subjects of express volitional deliberation. Full half the time of such a man goes to the deciding, or regretting, of matters which ought to be so ingrained in him as practically not to exist for his consciousness at all. If there be such daily duties not yet ingrained in any one of my readers, let him begin this very hour to set the matter right."

Unhappy
effect of in-
decision.

Habits of
sleep.

Did you ever note the effect of fixed habits upon your own life? For seven months I rose every morning at 4:30. At the end of that time, the necessity for early rising having passed, I endeavored to sleep till six o'clock, but found I could not sleep after the accustomed hour for rising. It took me weeks to acquire the new habit. A friend of mine, while in college, was forced for nearly two months to prepare all his college work after 9:00 P.M. He retired at two o'clock and arose at 6:30. When it again became possible for him to work by day, he not only found study difficult, but was unable to go to sleep before two in the morning. He had to break away from his college work altogether for a time, in order to acquire again a normal habit of sleep.

The effect of
irregular
habits of
sleep on
evening
study.

There are students who are in the habit of retiring at no fixed hour. If some excitement attracts, they are up late. If the evening is dull, they retire early. They go to bed whenever they get sleepy. As a result, they find it almost impossible to do any effective studying in the evening. They are handicapped by somnolence at an hour when their best evening work should be done. If such students, by whatever possible means, fix the habit of retiring at ten or ten-thirty every night, they will find evening hours an excellent time for quiet study. Persistent habit will soon break the early sleepiness. Nine hours of sleep are enough for boys and girls in high school; eight, for college students.

It is the curse of irregular hours that nature can never be relied upon to hold a man's mind efficient

when efficiency is wanted. The young man who is out at night until one or two o'clock, and goes to bed the next night at eight-thirty or nine to make up his sleep, can never succeed as a student. He can never be sure that sleepiness will not overtake him early on the third night as well.

Of course all know what slaves bad habits make of those who get accustomed to lying, using slang or profanity, tobacco or liquor, etc. But did you ever realize that industry is a habit and idleness as well?

Idleness a
bad habit;
industry a
good one.

Many a student passes among teachers and classmates as a person of weak mentality when he is really only a habitual loafer. It has been my good fortune to create a crisis in the lives of some of these, as a result of which they broke the habit of idleness and launched the habit of industry. In such cases I have seen a record of failures cease and give way to the highest marks in the school. Habits are either cruel masters or powerful allies, according as men carelessly yield to vicious ones or thoughtfully accustom themselves to those which are helpful. The loafer is not happier than the industrious man; he may be an idler simply because he has become carelessly fixed in that bad habit, and is quite unconscious that he is indulging in one of the seven deadly sins.

The first thing that you as a student should do is to habituate yourself to fixed hours of study. Have definite hours for definite work and don't let the hour go by unemployed. In the course of a few weeks you can scarcely do anything but study when the hour comes. Haphazard students, who

Fixed hours
of study
make for
success and
happiness.

study a lesson one day at one hour and another day at another, frequently fail to study at all. For them it is just as hard to settle down to work at the last as it was at the first. The work gets no easier; they are always behindhand, hurried, and worried by unfinished work.

It is well to fill out a complete program of recitation and study hours at the beginning of the term. Suppose that in high school there are seven recitation periods, for five of which you are in class, as, for instance, the following:

9 : 00	A.M.	Algebra
9 : 45	"	_____
10 : 30	"	English
11 : 15	"	_____
1 : 00	P.M.	Latin
1 : 45	"	History
2 : 30-3 : 15		Physical Training and Art.

The 9:45 period should be devoted to the study of algebra. Just after the recitation the explanations will be remembered and the assignment clear. Interest will be at a higher pitch and the work can be done with less effort than at a subsequent time. For the same reasons the 11:15 period should be given to the study of English in preparation for the following day's recitation. If there are library references to be looked up in history, this work should be done directly after school hours.

A good program of home study would be as follows:

7 : 30- 8 : 00,	Latin.
8 : 10- 8 : 30,	Complete the Algebra preparation.
8 : 40- 9 : 30,	History
9 : 40-10 : 00,	Latin.

The following morning —

8:30- 8:50, Review History, English, and Latin.

Your schedule of study hours should be just as fixed and definite as your schedule of recitations, and should be adhered to just as rigidly. The objection will be made that it does not always require the same length of time to prepare the lessons in a given subject, some preparations requiring much less than the average time and others more. When the lesson requires less time, there will be more opportunity to review or to look ahead in anticipation of a longer lesson on the morrow. When a longer lesson has been assigned than the student can get in the reasonable time assigned for study, he should feel free to tell his instructor frankly that he had not time to prepare it *because* the assignment was too long.

Fixed hours of study and irregular assignments.

Further objection may be made to the program of home work on the ground that it keeps the student up too late or necessitates too much work by lamplight. If it is preferred, one hour's work may be done in the afternoon. In that case the evening work will be completed by nine o'clock. If the family has an early breakfast, an hour may be taken from the evening study and added to the morning before school. Yet another possibility is to take four hours on Saturday for preparing in some subject an entire week's work in advance; in history, English, or translation this can easily be done. A few minutes' review each day will then be all that is required. Thus the individual program may vary

Individual circumstances should govern the study program.

in many ways to accord with individual preferences. The important points are that a liberal allowance of time be given, and that the program once made be rigidly followed, at least until interest reënforces habit or makes strict hours less necessary. If other business requires punctual and regular attention, why should not the important business of studying?

Suppose a college man has a week's program of lectures and recitations as follows:

	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>
9-10	German	German	German	German	German
10-11	Mathematics	Math.	Math.	Math.	Math.
1-2	History	Economics	History	Economics	History
3-4	Phys. Tr.	Military D.	Phys. Tr.	M. Drill	Phys. Tr.

The periods of study and preparation may be assigned as follows:

- 11:00-12:00, Study German.
- 2:00- 3:00, Study Mathematics.
- 7:30- 8:30, Study History or Economics.
- 8:30- 9:30, Study Mathematics.
- 9:30-10:30, Study German.

The following morning —

- 8:00- 9:00, Study History and Economics.

Of course there will be ten minutes of rest and relaxation from time to time and especially between studies. This program anticipates no study at all on Saturday. If six or eight hours are devoted to study on Saturday, the program of work during the five days may be considerably shortened, and in most instances this would be highly desirable. Mental efficiency demands complete rest one day

Further
comment on
this study
program.

in seven. You will notice that in the college man's program the hours of greatest efficiency, in both morning and afternoon, are devoted to lectures and recitation; and that the climax of power in the evening comes at the hour devoted to mathematics. Some persons vary somewhat from this norm in their curve of mental efficiency. Those who eat an early and light breakfast may find the hour from eight to nine well suited to their hardest study.

The use of the mind is as instinctive as the use of the body. That which is instinctive is also agreeable. When once the work is fairly begun, when your mind is "limbered up" and you are warmed to the work, study will not seem so tedious as it did in contemplation before you began. You have seen a group of boys at the old swimming hole shivering for a moment on the bank because the water below looks cold. Presently one plunges in and cries, "Come on, fellows, it's dandy!" Another boy puts in first one foot, then the other, and wades slowly out with a shudder at every step. It is a long time before he begins to enjoy the swim. In your studies be like the hardy swimmer who plunges in at once. Don't stand shivering on the bank. You will find the work less difficult and much more enjoyable. More than that, you will accustom yourself to habits of promptness and industry that will carry you through many a struggle without the loss of energy that comes from indecision. You will do your work without so great effort of the will.

Plunging in and warming to the work.

Have fixed hours for study, and plunge in when the hour comes.

Summary.

IV. BEGIN BY RECALLING WHAT YOU ALREADY KNOW

Value of the
"appercep-
tive mass."

New ideas and facts are not easily grasped unless there are already present in the mind other facts which are more or less related to the new. We cannot readily assimilate that which has no bearing upon what we already know. In fact, the mind can with difficulty give attention to thought material which is wholly novel; for it can get no grip on that which does not relate to our present stock of knowledge. It is one of the advantages of a liberal education that the expanding mind comes to have some knowledge and interest in every direction. Such expansion of knowledge and extension of interest act to strengthen the attention and add still further to the interest. Attention is stronger in the adult than in the young; in the learned than in the ignorant. The more we know, the more easily can we acquire more knowledge.

Recalling
the previous
lesson.

However slender your stock of knowledge may be, you should make use of what you have in acquiring more. You can easily begin by recalling what you have learned before on the subject or lesson in hand. For instance, in history, first go back to the previous lesson and recall what you studied and what was brought out in class. You will begin to wonder how certain events are to turn out. Curiosity will become active. You will get a purpose for

going further, a live interest. The purpose will make further reading far more effective, as well as easier and more pleasant.

It is well to look at the general topics of the new lesson and then recall whether you have ever learned anything from any source whatever, in school or out, about these topics. In the light of the previous lesson and of what you have learned elsewhere, imagine the general content of the new material for study; think what it will be about; in the history lesson, think what events will result from what you already know. Now read to satisfy your mind.

Recalling
ideas related
to the lesson
topic.

This method of work is not fanciful nor merely theoretical. Some of the greatest minds among the most eminent statesmen and scholars have practiced it. John Morley, Daniel Webster, Lord Strafford, and Noah Porter are examples. They had a way of recalling the related old before reading the new — a way which the known principles of psychology now approve, a way which must result in increased interest and attention. It strengthens the memory; for it makes recall of the new material quicker and more certain. It fastens the new thought to thoughts which you can already recall, and gives to it almost as great ease of recurrence. If you can recall *A*, and *B* is associated in your mind with *A*, then you can recall *B* also.

Value of
this method.

Nothing in the mind exists unrelated. Whatever is there has been introduced by something else that will always be associated with it in thought. The mind tends to recall the one thing when it recalls the other. Facts that have the greatest number

Relate the
new to the
old.

of associations are the most readily recalled. Those that are most isolated are most difficult to remember. Memory demands the association of ideas.

Controlling
the stream
of conscious-
ness.

It is not for the sake of memory alone that you should recall what you have previously learned before undertaking to read or study further on the same subject. Efforts to recall will help to give command of yourself, of your inner life, or stream of consciousness. Often other and more interesting ideas will rise and take the place of that which you wish to study or hold before your mind. Thoughts of other things will come between you and the difficult reading you wish to do. In such cases little reliance can be placed upon the will. Voluntary attention, as has been said, gives control for only a few seconds at a time and at the cost of exhausting effort. You become disgusted with work done so painfully, and are likely to lose confidence in yourself. But when such a period of recalling, such a warming-up process as has been described above, precedes the reading, then the mind can be held much more attentively fixed upon the work in hand. There is a gain in mental control.

Growth in
power of
recall and
consequent
value of
studies.

When the practice of recalling before reading shall have been kept up for some time, you will marvel at the facility which you have acquired. At first without the stimulus of teacher and class it will be almost impossible to remember the previous lesson. You will find yourself stealing a look into the text in order to get started. As days go by you will recall more and more of the previous lessons. The subject matter, instead of being car-

ried to the threshold of memory and then pushed off into the limbo of forgotten things, will become alive; it will become a subject of thought on which you will ponder in leisure hours and of which you will speak when you walk and talk with friends.

It is necessary in study to have general purposes that spur one seriously to make the first efforts. You must have such good reasons for study as were considered under the caption, "Know that your work is worth while."¹ It is quite as necessary to have immediate objects and purposes in preparing each specific assignment. You may know in general that you ought to study, yet fail to do so because you lack an immediate purpose. Such a purpose will be secured by recalling what you already know before reading further; and this purpose will be your own. It may come to you in the form of a problem, suggested by natural curiosity — a problem for which you will desire to find a solution by further study. Again, a question may arise in your mind which you will desire to answer by reading on. Aimless study is about the weakest thing imaginable. Purposeful study is the parent of all progress and invention.

Recall gives immediate purposes in study.

In order to put yourself in full possession of your faculties when you begin to study, warm up to your work by recalling what you already know on the subject.

Summary.

Recalling will make the work more purposeful and interesting, will increase your power of attention, and will help you both to understand and to remember what you read.

¹ See pages 5-10.

✓

V. FIRST STUDY THE LESSON AS A WHOLE;
THEN GO BACK TO DIFFICULTIES

Useful
knowledge
is related.

Much time may be gained in the preparation of a lesson if it is first studied as a whole. Knowledge does not exist as separate units. Facts cannot be regarded as so many distinct pebbles that may be dropped into the mind one at a time. The jewels of thought are not solitaires; they may be likened, rather, to a string of pearls. You cannot attempt to store them in your mind, one by one, without losing many and destroying the beauty and significance of all.

It is more
easily re-
membered if
the rela-
tions are
seen.

Observe the workings of your own mind. Notice how, when you think of one thing, another idea which is in some way related to it comes presently into your mind. If the relationship is clear when the facts are studied, they will be easily remembered. Each fact will help you to remember the others related to it. Contrasts, similarities, relations of cause and effect, of nearness in place and time — these are the more usual relations that connect one idea with another. The thought will be more easily remembered if the assignment is studied as a whole rather than by parts; for only so can the connecting relations be seen.

Examples of
this.

Thus the government and the social life of Athens become clearer and more easily remembered by contrasting them with those of Sparta. The flora and

fauna of any region are more easily grasped by comparison with those of other regions that have similar climatic conditions. The American Revolution becomes far more significant and its details easier to recall, if we know its causes and results as well as the chain of events that brought it to a conclusion. The historical events that preceded and attended a literary period give meaning to that period. In earth study, the gorge and the waterfall can be easily understood when other effects of erosion are studied at the same time. Examples of the benefits of association of ideas by first studying the whole may be multiplied in every school subject. The recollection of one of these associated ideas will bring to mind the other related facts and all will gain in clearness by the association.

To study without understanding is to learn words, not thoughts. When the relations are seen, the thought is understood. Every one has seen young children poring over a sentence and then repeating it word by word, over and over again, to memorize it. This is an exceedingly long and laborious way of acquiring knowledge. It takes very much longer to learn by repeating sentences than it does by repeating the whole assignment. And when the assignment has been memorized sentence by sentence, there is very great danger that it will not be in the least understood; in which case the learning is worse than useless.

Furthermore, learning sentence by sentence takes no account of the unequal values of sentences. Some single sentences have the thought of a whole

Learning sentence by sentence difficult and unprofitable.

In the light of the whole values are seen.

paragraph packed into them. Others are merely transitional or introductory, and serve only as sign posts to point the thought on toward the really significant thing which is coming in a later sentence. Some sentences merely repeat in other words or sum up what was said in a previous sentence or sentences. In the light of the whole, the inequality of values is clearly seen; and then the mind hurries over the unimportant and dwells on that which is truly significant.

When the whole has once been read, a second reading becomes full of meaning. The thought plays over and around each sentence as you read, bringing light from the whole lesson with which to illumine and explain each part. You read between the lines, reflecting as you read upon the similarities and contrasts and upon the relations of cause and effect. All this work adds to the interest and gives power of attention, which "is the mother of memory."

In the translation of an assignment of work in a foreign language, your first step after recalling the content of the previous lesson should be to endeavor to get the author's drift by reading the whole assignment or a considerable part of it at sight. In the light of the whole, go back and look up the new words. You will quickly see the special meaning of a new word when you have the general thought of the passage to guide you. Without a first rapid survey of the whole, you are likely to choose the wrong translation, for many a word has widely divergent meanings; and your progress will be slow,

Method
applied in
translating.

for you will flounder along in confusion and doubt if you have not first seen the general drift of the thought.

In the study of history it is especially important to study by wholes. It will be found that part is related to part; and the significance of each will be seen in its relation to the rest. History lessons should be studied by the topical method, even if some topics are too long for one day's recitation. I know a young man whose history work gains interest and power from the fact that for hours on Saturday of each week he reads far in advance of the class. Naturally enough he enjoys this reading. When very short sections of either history or literature are read at intervals of a day, the relation of part to part is often not sufficiently evident to make interesting reading. The student loses the connection, and is almost forced to fall back on the process of memory cramming.

It makes
history
more
interesting.

Even in mathematics it is a mistake not to look over the whole lesson before beginning the solutions. Some problems will be found easier than others, and should be solved first, whether they come first or last in the text. The power and insight gained by solving them may be sufficient to enable you to solve those which at first were found too difficult. I have known pupils to "get stuck" upon the second or third problem of a lesson, and lose all their time on it without even taking a look at problems farther on which might have been solved with little effort.

Applicable
to mathe-
matics.

It is especially valuable in all examinations to

go over the whole paper and answer first the questions to which answers and solutions readily occur to you. Thus a larger portion of the questions will have been answered in the given time.

What is true of language, literature, history, and mathematics is equally true of each of the sciences. These should also be mastered as wholes rather than as parts. In science the data are related to general laws, and many of the laws are interrelated. Reading ahead to get a bird's-eye view of what is coming will often render rich returns of insight and interest.

Learning by
heart.

In memorizing a poem of even two or three pages in length, much time can be saved by repeating the poem from beginning to end, and much wasted by repeating individual stanzas or lines. Make no mistakes in the first reading, for every mistake tends to repeat itself. Care should be taken to go slowly; later repetitions may be the faster and surer because of early care and accuracy.

Summary.

To sum up, endeavor to follow the law of association of ideas; try to relate knowledge as you acquire it.

In order to further this end, study by wholes rather than by parts.

Go back to special difficulties and solve them in the light of the whole.

Then go over the lesson again as a whole and read into every part the significance given it by the previous general survey.

VI. STUDY ALOUD OR WITH LIPS MOVING

If one of our students were to enter a Chinese school, he would laugh to hear pupils studying at the top of their voices. But such a method is not without scientific justification. The louder voice makes the deeper impression; and though the confusion of other voices in the same room at the same time may in some degree offset the gain, nevertheless it is true that to study in an undertone or with lips moving is a decided advantage to the young student in difficult work. Certainly he should not annoy others.

Chinese schools not so ridiculous.

All during waking hours there passes through the mind a stream of consciousness. The thought runs on from one related thing to another in endless succession. Many thought images are rejected at once by the will, while others are chosen for further consideration. Especially recurrent in the stream of consciousness are thoughts of those things that interest us. Interesting thoughts come back again and again, while the uninteresting can scarcely get attention. Sometimes in the stream is a strain of music, a popular song; sometimes pictures of things seen; and sometimes mere feelings. Often one is conscious of a succession of spoken words heard within him. All these are called *thought images* or *mental imagery*, whether they repeat things perceived by eye and ear, or things felt.

“The stream of consciousness.”

It tends to flow in independent channels in hard reading.

Now this stream of consciousness goes on when you study. If you have a body of knowledge or experience related to that about which you are reading, the stream will play about the author's thought, expanding, explaining, testing, or illustrating it; in this way, of course, you are greatly aided in understanding what you study. So we insist that you begin your study by recalling what you have already learned. But very often with young students there is no body of knowledge already present in the mind to flow along as directed by the reading; and when such knowledge is lacking there is great likelihood that consciousness will flow in independent channels and completely shut out the author. Thus other thoughts, more insistent and backed by a vigorous memory, may rise and come between you and your work. *In that case it is far easier to hold attention on the text when you pronounce the words aloud.*

Mental imagery, auditory, visual, and motor.

There is another reason for reading aloud: you can remember better what you read. The stream of consciousness described above will be recognized as the activity of memory. It is clear from what has been said that there is a memory for sounds. This may come to predominate in some minds, especially in that of the actor, clergyman, or public speaker, much of whose consciousness is likely to be haunted by the memory of spoken words. The musician's mind, by the same token, will be haunted by the sound of tunes. The builder, artist, architect, or engineer may find that his stream of consciousness is largely made up of things seen. While

all who speak or sing or use their hands with skill will have in sensations from the muscles of throat, fingers, etc., a motor reflex, which is the memory of things done. This last form of memory, called *motor imagery*, is quite as important as any of the others; though it may act more automatically, so that we are as a result less conscious of it. Consider how the pianist memorizes the execution of long and difficult compositions. Memory acts so powerfully that he remembers and repeats difficult fingering without conscious effort. Not less wonderful is the memory of tensions in the vocal chords acquired by trained singers.

By studying aloud you can make use of the motor memory, while at the same time you are making channels for the subject matter to connect with the visual and the auditory memory-tracts. A few words of explanation may be necessary here. Certain areas or tracts on the outer surface of the brain are centers for impulses from certain external organs. Different areas receive and send out special sense or motor impulses. Thus there is a center that connects with organs of sight, another with organs of hearing, and there is a third center for motor and touch impulses. Associated with each is a region that retains, works over, and gets ideas from these impulses or sensations.

Sometimes one center is more highly efficient than another in the same brain. Sometimes accident or disease takes away all efficiency from a center; as when a person, still able to understand words that *he hears*, loses the power to get ideas

Studying
aloud gives
multiple im-
agery.

Effect of
multiple im-
agery on
memory.

from the words *he sees* on a printed page. When the visual center is highly efficient, the person is said to be eye-minded. Other persons are ear-minded or motor-minded. It is seldom if ever true that people are exclusively eye-minded, ear-minded, or motor-minded. Memory acts by all these paths according as the original sensation comes to us. *The ability to recall a thing will be greatly increased if all three forms of imagery — the visual, auditory, and motor — are employed.*

Especially
valuable in
learning a
foreign
tongue.

In the study of foreign languages, ancient as well as modern, it is especially important to study aloud. In fact, the development of motor and auditory imagery is often the key to success. In the case of language the memory for words acts more naturally through sound channels than through those of sight. It has been well said that the true word is the spoken word; and that its real significance can never be learned except through the medium of speech. Appreciation of style as revealed by rhythm is impossible without the sound. Therefore, in learning a language, it should be read aloud. Again and again read aloud in the foreign tongue.

Studying
aloud pre-
pares best
for oral reci-
tations.

Whatever the subject, if the recitation is to be an oral one, students will find it especially helpful to read the lesson aloud. End the study of a passage of Latin by translating it aloud. It will make translation in class doubly sure. History, English, rhetoric, science, any subject — if hard or if an oral recitation is to follow — will be more easily learned by studying it aloud or with lips moving.

To sum up: Study aloud or with lips moving in order (1) to strengthen attention and hold the mind upon the work in hand, and (2) to strengthen the memory by providing more mediums for recall.

Summary.

VII. PRACTICE RECALL AS YOU STUDY; AND IN DRILL WORK REPEAT AT INCREASING INTERVALS

Recall of
previous
lesson.

You have seen the value of recalling what was learned at the previous recitation and elsewhere on the topic assigned, before you begin the study of the topic or assignment. This recall was for two purposes, (1) to use this material as hooks on which to fasten the new knowledge, and (2) to allow the mind to create a purpose for study through curiosity and natural interest, so that the attention will be stronger.

Recall dur-
ing study.

From time to time during the process of study there should be brief periods of recall at which the material you have just read is quickly reviewed. The purpose of such a period is also two-fold: in the first place, it enables you to test the efficiency of your attention during the reading, by asking whether you are really *getting the thought*; and in the second place, it helps you to make what you study available for future use by *fixing it* more securely *in the memory*.

This gives
understand-
ing and con-
centration.

There is no better way to find out whether words are being seen without their thought content, or meaning, than by pausing from time to time to recall the thought. No effort should be made to recall the exact wording. Instead, a conscious effort should be made to frame the author's thought without regard to his words. Such a test is searching and calls for vigor of intellect. It will be found

wearisome, especially at first, to those who have never practiced it. But be assured there is no other method half so valuable in acquiring the power of concentration, which is the key to successful scholarship.

How many a student in high school and in college thinks he is studying when really he is only reading *words!* He comes to a quiz in philosophy or in political economy only to find that the hours he has spent in reading have availed him nothing. He cannot even remember the words, while of course he had never really reached the thought back of the words. The habit of stopping to recall may seem at first wasteful, but in the end it is by far the quickest way to learn. It is safe to say that when it is acquired early in a high school or college course, it saves much of the student's time. If persisted in there comes at last such power of concentration that in a single reading the trained mind learns more than the untrained learns in half a dozen readings.

Frequent waste of time in study without recall.

There are or should be limitations to the use of the method of frequent recall. It need not be used at all in easy reading; as, for example, English literature. It is the reading of unfamiliar, abstract, abstruse thought that needs frequent testing. And bear in mind, also, that pauses should occur only at divisions of thought. The more difficult the thought, the more frequent the pauses must be, but the paragraph ending will usually mark the place for recalling and recasting in the mind the difficult thought in the paragraph.

Especially valuable in hard reading.

So much for the method of frequent recall in difficult reading as a means of testing the efficiency of attention. Another reason for this practice is to make the thought more available for future use by fixing it more firmly in the memory.

Value of
right memo-
rizing.

Of late years there has been a good deal said and written against what is called "mere memorizing." I take it, however, that the quarrel is not really with memorizing as such, but with the *method of memorizing*. It is the habit of memorizing mere words without mastering the meaning back of them that educators decry when they speak of "mere memorizing." They insist upon learning to understand rather than to remember. Yet to understand anything is the best and surest way of remembering it; nor is any truth of so little value to the student as to be best forgotten.

Where drill
is needed.

A considerable part of the work done in high school and college is of a sort that demands learning *by heart*. Of course this process is most necessary in earlier education. Memory drill alone can adequately fix the multiplication table, the rules and forms of English grammar, and the spelling of difficult words. The foreign language courses of high school and college make a like appeal for memory drill. Even in a course like geometry, which is supposed to train the reasoning powers almost exclusively, if the theorems, axioms, and postulates are not memorized, the attack on new work is weakened. Memory brings up the ammunition without which new problems will not succumb to attack. It has been justly said, "Memory is the

purveyor of reason." It furnishes the materials of thought here and everywhere.

Thus a knowledge of the best methods of fixing needed facts in the memory will always be valuable to the student. For drill work, repetition as well as recall will be found necessary. In memorizing or other drill work, *repeat at increasing intervals*.

For instance, suppose you wish to master the spelling of a new and difficult word: you will not learn it so thoroughly by spelling it aloud or writing it ten consecutive times as you will by repeating the spelling say twice in the morning, twice in the afternoon, twice on the morrow, twice on the fourth day, and twice on the tenth day. The law applies to other pure memory processes, such as learning a poem or the vocabulary of a foreign language. Frequent short sittings are much more effective for drill than one long one; and if these short sittings are repeated at increasing intervals, the retention of the matter studied will be far more sure and enduring.

Each repetition at a given time occurs with less interest and attention, and in consequence with weakened effect upon the mind. But after an interval the effect of a repetition will again be heightened. *Fatigue* and *ennui* are both fatal to efficient study. To avoid these in drill work, have frequent short sittings rather than a single long one, and repeat at increasing intervals. Out of all proportion to the time required for such reviews is the value received. And nearly every subject has some principles of such prime importance as to warrant fixing them in the mind by drill.

In drill work repeat at increasing intervals.

Reason for increase of intervals.

Summary.

To test the efficiency of your reading and to compel the right attention in difficult passages, pause from time to time at the natural pauses of thought and recall what you have just read to see if you are getting the thought. This will also help to fix in mind what you are reading.

In drill work make frequent short sittings and repeat at increasing intervals.

VIII. MAKE A SYNOPSIS AND VISUALIZE IT

McMurry, in *How to Study and Teaching Others How to Study*, calls attention to the fact that the field of thought is never a level plain, but more like a range of mountains in which important ideas rise like peaks above those of lesser importance. Each of the peaks is supported by masses of related details at its base. It should be the chief end of study, the first and last business of the student, to discern the mountain peaks, to see that the main thoughts do stand out prominently in the mind and that all the lesser details are grouped in right relation to them and to one another.

Peaks of
thought.

In discerning relative importance, much will already have been done for you when the high school is reached. Good teachers of oral reading will have taught you to dwell longer and to place greater emphasis of voice upon those sentences and passages that contain important thoughts. They will have taught you to give less time and stress to the words and sentences that are relatively unimportant. Teachers of grammar will have helped you to keep in mind the subject of thought in each sentence, and to see what is closely related and what is loosely related, what is subordinate and what is independent in the relations within the sentence. Teachers of Latin will have taught you to test the accuracy of your translations by demand-

Previous
training in
the discern-
ment of im-
portant
points.

ing that every sentence shall yield up a sensible meaning of its own, as well as show a clear and definite relation to other sentences.

Help from
your training
in English.

Teachers of rhetoric in the high school will help you to see the relations within a paragraph; to pick out the topic sentence, the transitional, the illustrative, the summarizing sentences — ability of great value in discovering the peaks of thought. In all your reading, sentence study will help you to see the important thoughts of the paragraph and to discern the relations of other sentences to these. In your work in English literature you will learn to see the plot in fiction, the forces contesting for supremacy, the episodes that develop the plot, and the relation of each episode to the ultimate solution, all such learning bringing increase to your powers.

Value of the
outline or
synopsis.

But in my opinion the most valuable training a student receives, that which will help him most in the preparation of nearly all his work, is the training in outlining by synopsis the thought of an author like Burke or like Macaulay.

Outline of
Burke's
speech.

Below is part of a synoptical outline of Burke's Speech on Conciliation. Notice how the mountain peaks of thought are brought out under the headings in capital letters, *A* and *B*; how subordinate headings of lesser though still important weight come under the Roman numerals; while subordinate to these are other points under Arabic numerals, which in turn may have subordinate details under small letters. The peaks of thought are set further to the left. It is essential, also, to

clearness of thought in such an outline to arrange in a vertical column headings which are coördinate in thought, so that one will come directly under another. It is also important that coördinate headings, being parallel in thought, be made parallel in wording and in construction, as, for example, through the device of using the same introductory word for the sentences, or by having coördinate thoughts cast in the same sentence forms.

BURKE'S SPEECH ON CONCILIATION

Introduction

- A. Why Burke speaks on the American question at this time. Burke's
speech on
conciliation.
- I. The American question is worthy of the serious attention of Parliament.
 1. Parliament regarded it as serious when Burke first took his seat.
 2. Parliament has been fluctuating in opinion regarding the method of treating America, while Burke has not.
 3. Parliament has taken no effective measures dealing with America.
 - II. Burke feels called upon to speak for the opposition.
 1. His party must show its hand.
 2. His own insignificance may aid his cause by divesting it of all personal consideration.
- B. Burke's proposition is to secure peace by reconciliation.
- I. His proposal of peace differs from Lord North's.
 1. Because it does not propose an auction of finance.
 - II. His proposal resembles Lord North's.
 1. Because North's is based upon the same principle of peace and reconciliation.
- III. This proposal of peace should come from England.
1. Because England is the superior power.

- IV. Argument as to why and how England should concede should be based not on theory but on the nature and circumstances of America.

Brief Proper

A. England ought to conciliate the colonies.

- I. Because the population and wealth of America are too great to be disregarded.

1. Her great and growing population make her formidable.
2. Her commerce is extensive and important to England.
3. Her agricultural products support England.
4. Her fisheries exhibit the vigor of a free people.
5. Force is not the best means for preserving the colonies, since
 - a. Force is but temporary.
 - b. Force is uncertain.
 - c. Force impairs the very object it would preserve.
 - d. Force is not backed by experience.

- II. Because the temper and character of Americans render them formidable.

1. Their descent from Englishmen fosters a spirit of freedom.
 - a. As such they are devoted to freedom.
 - b. As such they regard the power of taxing themselves as the mark of freedom.
2. Their form of government fosters a spirit of freedom.
3. Their religion fosters this spirit.
4. Their institution of slavery fosters it.
5. Their education fosters it.
6. Their distance from England fosters it.

- III. Because coercion has been found unwise by experience.

1. It is hard to remove causes of trouble, since
 - a. It is unwise to check the growth in population and wealth.

- b.* It is impossible to alter the temper and character of the colonists.
- c.* It is impossible to pump the ocean dry.
- 2. It is impolitic to punish Americans as criminals, for
 - a.* Their number forbids criminal procedure.
 - b.* Their plea for privilege is not rebellion.
 - c.* Their punishment thus far by England has proved inexpedient.

B. England ought to conciliate the colonies by satisfying their complaint on the subject of taxation.

Etc.

When you must make a synopsis of any subject, bear in mind that peaks of thought are not isolated, but lie in a mountain *range*. In other words, you must recognize the relation of facts one with another — their sequence and connection in a given subject. Suppose, for instance, that the student of the history of English or American literature is making synoptical outlines of each author studied. His work may include the following topics :

Interrela-
tion of
points in
outline.

- 1. Name and dates.
- 2. Birthplace and residence.
- 3. Parentage.
- 4. Boyhood and education.
- 5. Travel and occupation.
- 6. Times.
- 7. Friends and contemporaries.
- 8. Works.
- 9. Style, character of work, and place in literature.

If each of the nine items listed above is studied with no reference to the rest, all will lack significance to the student and will soon be forgotten. Each item before 8 and 9 should be studied with a view to interpreting 8 and 9. If 2, or 3, or 4, or 5, or 6,

or 7 seems to have no bearing on 8 and 9, it should be disregarded in the outline.

Historical
outlines.

In the study of history, keep this principle in mind: that events are never a kaleidoscopic jumble, but bear relation to one another as of cause and effect. In every period of history there can be seen some distinguishing trait, some uniting principle, under which as a heading the events may be ranged with proper sequence of time and in orderly relation one to another.

As a rule there will be found in every topic some highly important points to which every other point relates. Notice it below in the two topical outlines, used in studying wars and presidential terms. In the former, all points bear upon the provisions of the *treaty of peace*; in the latter, all bear upon important legislation, and especially upon presidential measures and influences.

TOPICAL OUTLINE FOR THE STUDY OF A WAR

Name of War

1. Dates.
2. Causes.
 - a. Primary causes.
 - b. Secondary causes.
 - c. Precipitating cause.
3. Countries engaged.
4. Leaders.
5. Chief battles and results of each.
6. Turning points of the war.
7. Efforts toward peace.
8. Treaty.
 - a. Place.
 - b. Commissioners.
 - c. Provisions.

TOPICAL OUTLINE FOR THE STUDY OF A PRESIDENTIAL TERM

Name of President

1. Dates of presidential term.
2. Previous experience and training of the president.
3. Opponents in the election.
4. Votes.
 - a. Electoral.
 - b. Popular.
5. Events of importance.
6. Legislation of importance.
7. Presidential measures and influence on legislation.

A generalized outline, similar to the one above, may be used in studying the reigns of kings. In covering the events and movements of history it is wise to use as many different synopses as possible. Some synoptical forms will show details, others will note only the most important matters. An example of the latter form would be an outline of important events and movements by centuries. Some outlines will be devoted to leaders in statesmanship, war, literature, science, or industry; others will be devoted to causes leading to some great movement or event; still others to a chain of related events, etc. The chronological outline of a single brief period of history, such for instance as may be covered in the class discussion of a day or a week, should be only the beginning of development in important work of this kind.

Variety in
forms of
outlines.

History is a subject especially suited to the synoptical method of study, but it is not the only one. There is scarcely a subject in which the student will not be helped by making outlines. Grammar, rhetoric, and the sciences will be found

Synopses
valuable in
the study of
many sub-
jects.

wonderfully suited to study by synopsis; and such study will yield rich returns in learning and understanding. Even in mathematics, reviews and previews which outline the work in synopses will be valuable. Here is a generalized outline for the demonstration of any proposition in geometry:

1. Statement of the proposition.
2. Construction of the figure.
3. Data with reference to the figure.
4. Conclusion with reference to the figure.
5. Auxiliary constructions, if any.
6. Proof with reasons in full.
7. Conclusion.

Below is an outline typical of work covered in any department of the subject. Failure to keep in mind the propositions proved is often a cause of failure to make original demonstrations.

CONGRUENT TRIANGLES

I. Those having given two sides and the included angle of one equal respectively to two sides and the included angle of the other.

1. Construction lines needed, if any.
2. Method of proof.
3. Previous theorems, axioms, or postulates necessary to proof.
4. Corollaries.

II. Those having two angles and the included side of one equal respectively to two angles and the included side of the other.

1. Construction lines needed, if any.
2. Method of proof.
3. Previous theorems, axioms, or postulates necessary to proof.
4. Corollaries.

III. Those having three sides of one equal respectively to three sides of the other.

1. Construction lines needed, if any.
2. Method of proof.
3. Previous theorems, axioms, or postulates necessary to proof.
4. Corollaries.

In the same way outlines may be made of algebraic materials; rules, cases of factoring, methods of solving equations, all admit of outline.

Of the three types of mental imagery — *sound*, *sight*, and *touch* — the most enduring is that of *sight*. When you desire to fix anything permanently in the memory, make a synopsis and visualize it. Few can visualize page after page of reading matter. Points do not stand out clearly enough. But it is easy to fix a page containing two or three main headings with a certain definite number of sub-heads under each. *Thus, not only for the sake of a clearer understanding of the text should you make an outline of it, but also in order to remember what you study you should make a synopsis and visualize it.*

Permanence
of visual
imagery.

IX. LEARN WHEN AND HOW TO READ RAPIDLY

Thorough
learning a
slow pro-
cess.

The principles of effective study so far given apply to thorough learning and to the attack on new and difficult material. Thorough learning is necessarily slow; and when drill enters in, it will be found tedious. Yet, slow and tedious though it be, thoroughness of preparation from day to day will usually be found by far the most economical in time and energy. Especially is this true of progressive studies like languages and mathematics. The cost of mastering a new Latin word when it first appears is but a small fraction of the time necessary to learn it incidentally by thumbing the vocabulary and looking it up again and again as it recurs in the text. If today's formula in algebra or today's theorem in geometry is thoroughly learned, "salted down to keep," it will save hours of discouragement later on in the course. So it is in much of the student's work: more time and better methods of study today will save long hours of effort in the days to come.

Need of
rapid read-
ing at times.

And yet the student needs also to learn when and how to abandon slow, careful reading; he needs to know how to skim very lightly and rapidly over fifty or a hundred pages of text. It often happens in history that some matter is referred to which the student remembers having met in previous reading,

and he now wishes to refresh his mind concerning it. Often a thorough understanding of the passage before him demands this freshening up. It may be necessary to examine a hundred pages of text to find the point in question. Here is a need for rapid reading.

Likewise in the second year of algebra or in the work of the physics class the student may in his solution of a problem be halted till he runs back over his first year algebra and finds the necessary principles which had slipped from his memory. Here is another place for rapid reading.

The alert student will always be formulating questions from his text — questions which the single author does not clear up sufficiently. Answers to these questions call for the rapid consultation of other books. To freshen his memory and make sure of authority for statements that he wished to make in the preparation of this brief book for the press, the writer has had to run over hundreds of pages of authors previously read. All writers, speakers, debaters, and literary workers find constant need for rapid reading of this sort.

It is not necessary to go further to show how exceedingly valuable is the art of rapid reading. Many students read at all times at a pace not much faster than that acquired through oral reading. But much reading to be economically done demands a pace from two to four times as fast as oral reading.

Pace demanded.

To read fast it is necessary to read sentence groups rather than individual words. You must learn to leap from one sentence to the next, not

How to practice for speed.

stopping to dwell upon every word and phrase. You must learn to fill in the thought from two or three salient words in a line; and with no second glance you must press on, trusting to later sentences to clear up meanings that you do not instantly catch. Practice with reviews or with easy narratives where the subject-matter presents no special difficulties. In reading by sentences, give special attention to the beginning and end of each sentence. By purposeful practice in this art you can make great progress in ability to read rapidly. Suppose, for instance, after having studied a history assignment in the regular text followed in the class-room, you key yourself up for a ten-minute effort in rapid reading from some other history that covers much the same ground. One minute to the page would be a reasonably attainable speed in this, or ten pages in the ten minutes, while to read ten pages aloud or silently word by word might require from twenty to thirty minutes.

The knack
of rapid
reading.

At first you will perhaps get little from such rapid reading. There is a knack in it that must be acquired, but by practice you will soon learn to get all that you need. In the history work referred to above, for instance, you will get enough by rapid reading to enable you to compare the two authors, to see wherein they agree and wherein they differ in matters of fact, as well as in the relative importance and significance that they assign to their facts.

In consulting authorities, reading often has to be done at a very high speed. At the rate of one

minute to the page it would take four hours to read a book of two hundred and eighty pages. But it is often necessary to rush through an authority in an hour or even less. In looking up a question it is seldom necessary to read a book from cover to cover. Often, to satisfy your needs, you will consult the table of contents or the index, then turn directly to certain definite pages, and leave the rest unread. If, however, you desire to follow the author's argument or exposition through from beginning to end, you save time by reading by paragraphs rather than by sentences. If you have studied rhetoric you know that paragraphs mean larger units of thought. The subject of the paragraph is usually stated in a brief sentence known as the topic sentence. The topic sentence usually comes first in the paragraph. The other sentences of the paragraph either repeat in other words or illustrate the thought contained in the topic sentence. Sometimes, preceding the topic sentence, there is a preparatory sentence which serves to lead up to the new topic of discussion, and which is known as a transitional sentence. It may be passed over quickly. Occasionally the topic sentence is reserved for the end of the paragraph. Nearly always the last sentence of a paragraph is important to the reader; it frequently contains a summary of the thought. To read by paragraphs, glance at the first short sentence or two in a paragraph. If this is sufficient skip the rest of it and go at once to the next paragraph. If the first or second sentence does not develop enough thought to carry you on,

Reading by
paragraphs
and topic
sentences.

glance at the last sentence. Of course, when occasion warrants, you will pause long enough to develop the topic still further by reading whatever intervening sentences are seen to bear vitally upon the subject.

A still more rapid way to make a book yield up its kernel of thought is to read only the first paragraph or two and the last in each chapter. Notice how in this book the last paragraph sums up the thought in each chapter.

We have now had the principles of rapid reading. They are as follows:

Where to look for the gist of a chapter.

Summary. 1. *In rapid reading do not halt over words one at a time or submit them to inward hearing.*

2. *In reading by sentence units, regard especially the beginning and the end of sentences. The subject is usually near the beginning.*

3. *In reading by paragraph units, give special attention to the first or second and the last sentences; here usually are found the topic and summary of the paragraph.*

4. *In reading by chapter units, pay special attention to the first and last paragraphs of the chapter. In the first the subject of the chapter is usually developed; the last usually contains a summary or an important conclusion.*

5. *Learn to use indexes and tables of contents to help in locating the material that you want.*

Let us apply the principle of rapid reading to one of Addison's Essays :

THE SPECTATOR ON EXERCISE

Ut sit mens sana in corpore sano. — JUVENAL.

A healthy body and a mind at ease.

[1] Bodily labour is of two kinds, either that which a man submits to for his livelihood, or that which he undergoes for his pleasure. The latter of them generally changes the name of labour for that of exercise, but differs only from ordinary labour as it rises from another motive.

[2] A country life abounds in both these kinds of labour, and for that reason gives a man a greater stock of health, and consequently a more perfect enjoyment of himself, than any other way of life. I consider the body as a system of tubes and glands, or, to use a more rustic phrase, a bundle of pipes and strainers, fitted to one another after so wonderful a manner as to make a proper engine for the soul to work with. This description does not only comprehend the bowels, bones, tendons, veins, nerves, and arteries, but every muscle and every ligature, which is a composition of fibres that are so many imperceptible tubes or pipes, interwoven on all sides with invisible glands or strainers.

[3] This general idea of a human body, without considering it in its niceties of anatomy, lets us see how absolutely necessary labour is for the right preservation of it. There must be frequent motions and agitations, to mix, digest, and separate the juices contained in it, as well as to clear and cleanse that infinitude of pipes and strainers of which it is composed, and to give their solid parts a more firm and lasting tone. Labour or exercise ferments the humours, casts them into their proper channels, throws off redundancies, and helps nature in those secret distributions, without which the body cannot subsist in its vigour, nor the soul act with cheerfulness.

[4] I might here mention the effects which this has upon all the faculties of the mind, by keeping the understanding clear, the imagination untroubled, and refining those spirits that are necessary for the proper exertion of our intellectual faculties, during the present laws of union between soul and body. It is to a neglect in this particular that we must ascribe the spleen,

which is so frequent in men of studious and sedentary tempers, as well as the vapours, to which those of the other sex are so often subject.

[5] Had not exercise been absolutely necessary for our well-being, nature would not have made the body so proper for it, by giving such an activity to the limbs, and such a pliancy to every part as necessarily produce those compressions, extensions, contortions, dilatations, and all other kinds of motions that are necessary for the preservation of such a system of tubes and glands as has been before mentioned. And that we might not want inducements to engage us in such an exercise of the body as is proper for its welfare, it is so ordered that nothing valuable can be procured without it. Not to mention riches and honour, even food and raiment are not to be come at without the toil of the hands and sweat of the brows. Providence furnishes materials, but expects that we should work them up ourselves. The earth must be laboured before it gives its increase; and when it is forced into its several products, how many hands must they pass through before they are fit for use! Manufactures, trade, and agriculture naturally employ more than nineteen parts of the species in twenty; and as for those who are not obliged to labour, by the condition in which they are born, they are more miserable than the rest of mankind, unless they indulge themselves in that voluntary labour which goes by the name of exercise.

[6] My friend Sir Roger has been an indefatigable man in business of this kind, and has hung several parts of his house with the trophies of his former labours. The walls of his great hall are covered with the horns of several kinds of deer that he has killed in the chase, which he thinks the most valuable furniture of his house, as they afford him frequent topics of discourse and show that he has not been idle. At the lower end of the hall is a large otter's skin stuffed with hay, which his mother ordered to be hung up in that manner, and the knight looks upon it with great satisfaction, because it seems he was but nine years old when his dog killed him. A little room adjoining to the hall is a kind of arsenal filled with guns of several sizes and inventions, with which the knight has made great

havoc in the woods, and destroyed many thousand of pheasants, partridges, and woodcocks. His stable doors are patched with noses that belonged to foxes of the knight's own hunting down. Sir Roger showed me one of them that for distinction's sake has a brass nail struck through it, which cost him about fifteen hours' riding, carried him through half a dozen counties, killed him a brace of geldings, and lost above half his dogs. This the knight looks upon as one of the greatest exploits of his life. The perverse widow, whom I have given some account of, was the death of several foxes; for Sir Roger has told me that in the course of his amours he patched the western door of his stable. Whenever the widow was cruel, the foxes were sure to pay for it. In proportion as his passion for the widow abated, and old age came on, he left off fox-hunting; but a hare is not yet safe that sits within ten miles of his house.

[7] There is no kind of exercise which I would so recommend to my readers of both sexes as this of riding, as there is none which so much conduces to health, and is every way accommodated to the body, according to the idea which I have given of it. Dr. Sydenham is very lavish in its praises; and if the English reader will see the mechanical effects of it described at length, he may find them in a book published not many years since, under the title of *Medicina Gymnastica*. For my own part, when I am in town, for want of these opportunities, I exercise myself an hour every morning upon a dumb-bell that is placed in a corner of my room, and pleases me the more because it does everything I require of it in the most profound silence. My landlady and her daughters are so well acquainted with my hours of exercise, that they never come into my room to disturb me whilst I am ringing.

[8] When I was some years younger than I am at present, I used to employ myself in a more laborious diversion, which I learned from a Latin treatise of exercises that is written with great erudition: it is there called the *σκιωμαχία*, or the fighting with a man's own shadow, and consists in the brandishing of two short sticks grasped in each hand, and laden with plugs of lead at either end. This opens the chest, exer-

cises the limbs, and gives a man all the pleasure of boxing, without the blows. I could wish that several learned men would lay out that time which they employ in controversies and disputes about nothing, in this method of fighting with their own shadows. It might conduce very much to evaporate the spleen, which makes them uneasy to the public as well as to themselves.

To conclude, as I am a compound of soul and body, I consider myself as obliged to a double scheme of duties; and think I have not fulfilled the business of the day, when I do not thus employ the one in labour and exercise, as well as the other in study and contemplation.

Method applied.

In the first place notice how large a part of the whole thought is contained in the first and last paragraphs.

Now take the other paragraphs and see how much of the thought may be gleaned by a rapid reading that notices especially the beginning and the end of each paragraph and only enough words in the sentence to catch the author's meaning. Observe that the beginning and end of the sentence are usually important and that the semicolon must be treated as a period. Instead of periods vertical lines are used to indicate full stops.

[2] A country life—a more perfect enjoyment—than any other| I consider the body—system of tubes and glands|—interwoven on all sides with invisible glands or strainers|

[3] This general idea of a human body—necessary labor is for the right preservation of it|—must be frequent motions—to mix—give solid parts more firm and lasting tone| Labor or exercise ferments the humors, casts them into their proper channels—without which—body cannot subsist in its vigor, nor—soul act with cheerfulness|

[4] I might here mention effects—mind, understanding clear——|——neglect——spleen in men——vapors——of other sex——|

[5] Had not exercise been absolutely necessary——nature would not have made body so proper for it|—— And that we might not want inducements——nothing valuable——without it|——riches, honor, food, raiment——sweat of the brows| Providence furnishes materials——work them up ourselves| The earth must be labored——before——fit for use| Manufactures, trade and agriculture employ nineteen parts of the species in twenty;——those not obliged to labor——miserable——unless——exercise|

[6] My friend Sir Roger——indefatigable in business of this kind,——hung——house with the trophies| walls——horns——deer——show——not been idle|——otter's skin stuffed——nine years old when dog killed him| Little room——kind of arsenal——guns——destroyed many thousands of pheasants, partridges and woodcocks| His stable doors are patched with noses——foxes| Sir Roger showed me one——killed him a brace of geldings and lost above half his dogs| This——one of the greatest exploits of his life| The perverse widow——the death of several foxes|——patched western door of his stable| Whenever the widow was cruel the foxes paid——| In proportion as his passion for the widow abated——left off fox hunting| but a hare is not yet safe——|

[7] There is no kind of exercise I would so recommend——as——riding——| Dr. Sydenham is very lavish in its praises——| For my own part——I exercise——upon a dumb-bell——| My landlady and her daughters——never——disturb me whilst I am ringing|

[8] When I——younger——a more laborious diversion|——called——fighting with a man's shadow——brandishing of two short sticks——plugs of lead at either end| This opens the chest, exercises the limbs——boxing without the blows| I could wish several learned men would——this method of fighting with their own shadows| It might conduce very much to evaporate the spleen, which makes them uneasy to the public as well as to themselves|

The Sir Roger sketch is purposely chosen as having greater difficulty than that of most narration; but you can follow the thought even here without seeing all the words.

Sight reading in music.

The pianist learns to read rapidly at sight four or five lines of notes representing soprano, alto, tenor, and bass, or any two or more of these parts together with an accompaniment. Such a feat makes rapid reading that takes in a whole line of words at a glance seem comparatively easy. The task is accomplished by the musician in this way: the performer neglects some of the easier parts of counterpoint, especially those notes which the laws of harmony fix in comparatively settled positions. At these he guesses in order to concentrate his attention upon the dominant theme. Just so the rapid reader of words must catch the dominant thought without reference to the repetitions and the relatively unimportant words and statements that may easily be guessed at.

Rapid reading of greatest value to advanced students.

The power to read rapidly is of relatively little value to the young pupil; but as he advances he will find it of more and more assistance. In the university the student will scarcely win distinction as a scholar without it. Practice in the art of rapid reading should begin in the high school.

X. STIMULATE YOUR EFFORTS WITH THE THOUGHT OF COMPETITION

Did you ever consider how much toil and hardship are endured for the sake of sport? How many weary miles the fisherman tramps through brush and brake and swamp to cast his fly for trout? How the hunter rises before daybreak and stands or crouches all day behind his screen, regardless of wet and cold and hunger, waiting for a chance to shoot at a flock of ducks; or toils through December snow up and down mountain sides to get a shot at a bear?

Willing toil
of sports-
men.

Parents often wonder why the same boy who yesterday threw every ounce of his strength into the football game, today can scarcely be induced to sift the ashes and attend to the furnace. It seems as if all useful activity were distasteful while all useless activity were the height of pleasure. There is a reason for the seeming perversity: *in the activity of the hunter, the fisherman, the football player, instincts as old as the race are called into play*, and these instincts are absent in the work of tending the furnace.

Football *vs.*
furnace.

You have noticed the power of habit to make that easy and even agreeable which was considered hard and distasteful. When you were advised to have fixed hours of study and to plunge in when the study hour comes, you were advised to make use

Play in-
stinct in at-
avistic pur-
suits and
contests.

of this law of our being. Now, race habits¹ which have been followed for ages by our ancestors have become instinctive in us; and all activity prompted by instinct is highly pleasurable. For countless ages men followed hunting and fishing as a means of livelihood. Their descendants now instinctively follow these occupations as pastime. For countless ages men fought in personal combat. Football is an expression of the old fighting spirit and it reproduces the sensations of battle. That is why boys like it so much. It is well that the instinct finds expression in play. G. Stanley Hall says that boys are less likely to fight in reality when this is the case. The fighting instinct is present in nearly all our games. Games take the form of contests; and the more closely they follow the elements of war, the more devoted their young followers are to them. Football, baseball, tennis, basketball, all embody the elements of a contest — the fight for supremacy.

Chess a war
game.

Nor is fighting confined to athletic contests. Consider the hours of vigorous mental activity that are given to chess, checkers, and whist. Hard mental effort here becomes delightful. It is the contest that makes it so. Chess is decidedly a war game; in it superior strategy wins. Kings and bishops and knights engage in battle. The pawns are the common soldiers, as the name implies, and the castles are fortified places to be taken or lost in

¹ This is G. Stanley Hall's theory. Colvin and others object to it. But it seems to the author a reasonable explanation of the play instinct.

the fight. So, too, games with checkers and with cards are contests of skill and strategy.

When men were not fighting for supremacy they were struggling for existence. At first they struggled for food; afterward for place, for wealth, for trade, for social esteem. Out of this world-old struggle the instinctive love of competition has come down to us as the basic principle in nearly all our play. It gives zest to work and to business. "Competition is the life of trade," as the saying goes. Our best efforts are made under rivalry. The athlete requires a rival to make the hundred in ten seconds. The "miler" must have a pacemaker to make his best time. The chess-player can give no such unflagging attention when planning moves alone as he gives when an opponent faces him.

Competition stimulates.

So the instincts to fight, to compete, to rival, to imitate — all of which are related — are powerful ones. Why not make use of these great stimulating instincts to further yourself in your studies — especially in those studies which you find hard and dry? It can be done to the student's advantage *if he plays the game in the right spirit*. If rivalry with another member of the class develops hatred or even unfriendliness, then it is not done in the right spirit. In that case rather let the rivalry cease. Good-will and friendship are greater things than scholarship. But I believe that there may be friendly rivalry — rivalry which forbids your gloating over your opponent's mistakes or misfortunes, and bids you be glad when the competitor compels you to exert yourself. Such rivalry does not make

Playing the game.

a competitor bitter when his rival gains the advantage, or overbearing when that rival is surpassed.

Healthy rivalry in school sports.

Our school sports are developing just such big-hearted rivalry as that. Why should not our work develop it? Young men are still friends after opposing each other to the limit in the games; just as lawyers on opposite sides struggle to win, each at the expense of the other, but when the case is settled they are good friends still. Probably in the vigorous atmosphere of strenuous competition not only is the best work done, but also the best and strongest character is developed. We have thought so on the playground; there is no reason for thinking otherwise in the class-room.

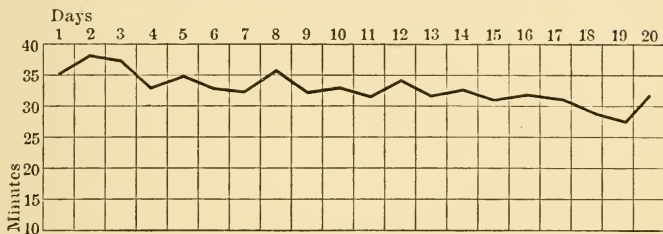
The pace-maker.

It is easy to develop a spirit of competition in study. Others all around you are performing the same tasks. Every recitation is a chance for you to match your ability with theirs. Every report-card is graded by competitive standards that make it possible for you to measure swords intellectually with your classmates and to know who wins. Pick out a classmate who is doing a little better than you in the same studies, use him as a pacemaker, and see if you cannot equal or even surpass him.

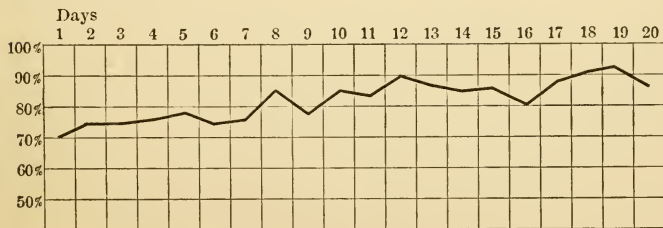
Competing with *Bogey*.

I believe it is possible for students to compete for love of the game without sacrificing friendship. But if after considerable trial you find it is not so, if you find your nature is such that even with an effort of will you cannot compete with another student without bitterness, then abandon all thought of such rivalry. Compete with yourself, with what the golfers call *Bogey*. Compare your efforts day

after day. Plot a curve to show your progress. How long does it take you to translate ten lines today, how long tomorrow, how long day after day? See if your curve will show a record of improvement like this of a Virgil student :



There is another excellent way to increase your attention in class while you give battle to *Bogey*. Keep tab of all questions asked in a recitation. Answer each to yourself. Put down a one for each that you get right and a zero for each you have wrong. Mark yourself after class on the scale of 100%. Plot a curve to show your progress from day to day. Try to beat *Bogey* in this way. See if your curve will go upward. Here is the curve made by a history student who tried this method for twenty days:



Summary.

In order to put the zest of play into dry, hard work and stimulate your best endeavor, make a game of it. This you can do by putting behind it the instinctive love of contest.

Endeavor to compete in recitation and grades with some member of the class who is usually of somewhat higher standing than yourself.

Be careful in such emulation that it does not develop into ill feeling.

Try also to compete with Bogey, and to this end keep curves of your efficiency in study and recitation.

By these means you will be carried through dry, hard work without ennui and with a maximum of efficiency.

XI. CONSERVE YOUR ENERGIES FOR STUDY

Study is or should be work; usually for students of high school age it is hard work. It requires energy to study effectively, just as it does to do any sort of work. There is fatigue of mind as well as fatigue of body; and in one way their effect is similar. While the expenditure of hard muscular energy for long hours day after day soon makes a man thin, mental work does not so quickly reduce the weight, but nevertheless both forms of fatigue make study ineffective. It is important to know that *there is no permanent impression upon a mind fatigued.*

Fatigue fatal to effective study.

Bodily fatigue is as fatal to effective study as is mental fatigue. The brain shares the fatigue of other members of the body. The lactic acid and acid potassium phosphate which are formed in the body by fatigue overflow from the wearied muscles and pass with the blood to all parts of the system. If some of the blood of a tired horse is injected into the veins of a fresh one, the latter will exhibit the same symptoms of fatigue as the former.

Fatigue due to chemical action.

In physical exhaustion it is the body, particularly the part subjected to strain, that seems most weary. Sometimes, however, serious mental disturbances result from bodily fatigue. In any event, effective study is as impossible in a state of physical exhaustion as it is in a state of mental exhaustion. It follows from what has been said that *it does not*

Muscular activity does not rest the mind.

rest the mind to engage in violent physical activity. There is a common misconception on this point. A moderate amount of exercise is absolutely requisite to good health. But the best remedy for mental fatigue is rest of both mind and body; and the poorest preparation for an evening of hard study is an afternoon of exercise so violent that it leaves one physically exhausted.

The unduly
"strenuous
life."

Hard physical work and hard mental work cannot be done in the same twenty-four hours except by very extraordinary men. The persistent attempt to lead a strenuous life in both these directions accounts for many a breakdown. Nervous prostration, of which staleness and overtraining are preliminary symptoms, is brought on quite as much by physical exhaustion as by too much mental strain. Of course, lack of ambition and man's inherent tendency to sloth keep nine-tenths of the young men from danger of overwork in either direction. In the case of the ambitious athlete, what usually happens is that physical weariness easily puts him to sleep over his books. Remember this, that as a rule the expenditure of great physical energy precludes the effective expenditure of mental energy in the same day. The rare exceptions only prove the rule. It is true that some few men are possessed of wonderful recuperative ability. They will be found to be huge eaters, whose powers of digestion and elimination are so great that they easily repair the waste in both brain and body, and permit large expenditure of energy through long hours. The average man cannot so eat or so digest.

Where great mental energy is demanded, physical repose will be found advisable. Probably the greatest display of mental power is the creative work of authors. A group of New England authors founded Brook Farm, thinking that they could be tillers of the soil and authors at the same time. But it is said that they found the expenditure of muscular energy in long hours of toil incompatible with a large output of creative brain work. Mark Twain went to bed to compose. Here his body was in a position of complete relaxation and allowed a maximum of energy to be employed in creative effort. A great French author also composed in a recumbent position. In a novel of Arnold Bennett's, called *The Great Man*, the hero is an author who discovers his talent as a writer while in bed convalescing from a mild case of measles.

Great mental activity aided by physical repose.

Let not the young student gather from the few examples of genius here given that he is to abstain from physical exercise. On the contrary, let him develop his physical powers to the full. It has been found that high marks in school go with lung capacity. Certainly broad shoulders and a strong physique are best adapted to bear the prolonged strain often necessary in business and professional life. Let the student acquire all he can of both physical and mental strength, in the years of growth and adjustment. But let him remember that to secure a maximum of power in either direction he must *stop short of fatigue*.

Value of physical exercise.

It is obvious that the student should not neglect his physical nature. Perhaps there is more danger

Danger in
too long
scrimmages.

of such neglect than there is of too violent activity. To keep the mind fresh, a certain amount of healthy play is of great importance; but long scrimmages at football and basketball, that leave the muscles trembling on the verge of complete exhaustion, are altogether fatal to good scholarship. Mountain climbers who have exhausted their energies in the ascent cannot get an interesting mental picture at the top, and are sometimes unable to remember the view for which they had toiled so hard. Boys who come to their studies in the evening utterly tired out will be unable the next morning to remember anything they studied the night before.

Signs of
mental
fatigue.

Mental fatigue from hard study comes sooner in high school years than in college. It is not always easy to detect mental fatigue. There is wide difference in its effect on different minds, and pathological conditions are not infrequent. The more usual symptoms of mental fatigue are (1) a falling off in the quality of the work, owing to the greater number of mistakes made, (2) a falling off in the quantity of work done in a given time, and (3) a greater tendency to be distracted, that is to say, more difficulty in holding attention on the work in hand. With mental fatigue there come first indifference and a disinclination to work; then come languor and a craving for sleep. Headache and restlessness follow. Then come excitement and heightened sensitiveness, especially to noises; nervousness, irritability, with passionate outbreaks and hysteria are the last symptoms. It sometimes requires months to recover from such a state.

Students who do not conserve their energies for study, who spend too much time in social life from day to day, in novel reading, and in outside activities are tempted to overwork at examination time and may be forced to leave college from exhaustion, while steady and really harder workers continue to progress.

Those who
break down.

The first symptoms of mental fatigue are hard to detect. Often a feeling of weariness is present where there is no fatigue. This soon passes when one settles down to work. On the other hand, overwork sometimes causes mental exhilaration and vividness of ideas to the over-stimulated brain. It will be much better to judge of mental fatigue by the time spent in work than by your own feelings. When actual nervous exhaustion comes, it is very difficult to get back to form; but five or ten minutes of complete rest introduced into the work every forty or fifty minutes will guard against such exhaustion and keep the mind fresh for vivid impressions. Such periodical rests will prove time-savers in the end.

Mental
fatigue not
always ap-
parent.

This period of rest should not be a change of work. There is stimulation in change of work that serves to keep one going; but change of occupation is not rest. A short walk of five or ten minutes will prove restful; but when the work is especially difficult, perhaps the most helpful aid is a period of complete relaxation of mind and body.

A change of
occupation
is not a rest.

If you desire to do your school work with a maximum of ease and efficiency you will avoid the use of stimulants and narcotics. Especially should

Effect of
tobacco on
adolescents.

you beware of coffee and tobacco in the high school years. During this period of rapid growth the heart is liable to weakness and irregularity. All its power is needed to force the blood into new tissue and capillaries. The work that nature demands of it at this time seems almost to overtax it. Tobacco weakens the heart and puts an added strain on it. It thus robs the system of vitality, increases inactivity and laziness, and gives the face an ashen and unhealthy look.

Effect on
scholarship.

Investigations in a number of schools and colleges have shown that smokers lose from ten to fifteen per cent of efficiency. Boys of only ordinary ability usually become failures when they take up the habit of smoking. Some think that the smoker's poor showing is due not to the narcotic, but to a general deterioration of character of which the smoking, like the low grades, is a symptom, not a cause. This might hold true were it not that students who smoke openly at home with the full consent of parents and without thought of wrongdoing are almost as badly affected by the habit as are the conscious recreants. The grades of these, just as of the other young smokers, fall off upon contracting the habit and rise upon breaking it.

Effect of
caffeine.

Coffee is a stimulant. Under its immediate effect students can keep on working when fatigued. For that very reason the stimulant is dangerous. Like tobacco, it taxes the heart. It usually affects the stomach and liver injuriously, and soon takes away healthy tone. While the immediate effect is to stimulate the cerebrum, increasing the reason-

ing powers and the imagination, the ultimate effect of caffeine is to deaden the mind. No athlete can keep in condition on coffee and tobacco. Neither can the young student. Growing youths especially should abjure tea, coffee, and tobacco.

Very much can be done to conserve your energies for study by watching the diet. Eat your hearty meal when you can have an hour or more of rest following it. The system needs at least one hearty meal a day and it requires energy to digest it. You have noticed how in the case of sickness the physician orders abstention from all hearty foods and prescribes a diet of broth, milk, or thin gruel. He knows that the system must have strength and energy with which to throw off the disease and recuperate, and that this energy should not be used up in digesting food. Besides, the patient often lacks strength to digest the hearty food. When you want energy for other work, lessen your demands on the stomach. Those who eat a hearty midday meal should not begin work again before two o'clock in the afternoon. If you wish energy for study in the middle of the day, you must avoid a hearty lunch.

The student's diet.

Most people find it difficult to do mental work after eating beef. Rare beef requires less energy for its digestion than that which is thoroughly cooked; lamb and mutton require less than veal, pork, or beef. Fish is regarded as particularly good for brain workers because it is so easily digested. "The digestibility of food," says Hutchison, "is of far greater concern to a brain worker than its

Effect of various foods.

chemical composition." The practice of overeating, or gluttony, produces weariness similar to actual fatigue. Such weariness comes from uric poisoning, the effect of which is incapacity for mental work.

Here are some health hints that will add to your happiness and efficiency as a student.

How to keep
in training.

1. *Eat* slowly of the foods that agree with you — sparingly before heavy exercise, study, or recitation, very sparingly when overtired or excited.

2. *Drink* a glass of water on rising and on retiring, and plentifully between meals.

3. *Breathe* deeply before an open window for five or ten minutes on rising and on retiring, and ventilate your room both night and day.

4. *Exercise* regularly and enjoy it to the full. Warm up gradually and finish quietly, stopping short of fatigue.

5. *Bathe* after moderate exercise. Begin with warm water and end with a dash of cool. Apply the coarse towel vigorously.

6. *Sleep* regularly, at least eight hours in twenty-four. When nervously tired and unable to sleep, take a warm bath before retiring.

7. *Rest* at proper intervals the mind as well as the body. The amount of rest needed varies with age and with strength as well as with the difficulty of the work. Most freshmen in high school need to relax for five or ten minutes after a half hour of strained attention. Most college students need to relax after an hour.

Stop short of fatigue, for there is no impression upon Summary.
a mind fatigued.

Take intervals of at least ten minutes for rest in every hour, and especially after finishing a lesson or unit of study.

Do not try to study when the body is fatigued or after a hearty meal.

Avoid stimulants and narcotics.

If you would give yourself to effective study, avoid too frequent social functions of an exciting character.

And finally, regulate your diet so that it will give a maximum of energy when you need it.

PART II

WHAT TO STUDY AND HOW

“For they [studies] teach not their own use.”

— FRANCIS BACON

FOREWORD TO PART II

A generation or two ago students in academies, high schools, and colleges had very little choice as to what they studied. The course was limited; Latin, Greek, and mathematics comprised a large part of the curriculum. In four years' time students graduated because they had completed about all the work the school or college had to offer them. In the present generation it would take more than a lifetime to complete all the work offered in one of the great universities; it would require at least ten years to complete the work offered in a modern high school.

From the great number of studies offered, the elective system becomes a necessity. You must choose a course from many alternatives, and to choose wisely you should have in advance a general knowledge of the subject-matter in each study and should know what value it offers you.

When every student was carrying exactly the same studies, no one was haunted by the fear that he had not chosen the right course. As it is today, John Jones, who has elected Latin, sees that Will Smith is taking no Latin at all; and he begins to doubt its value for himself, especially when he sees that Smith's mechanical drawing is much easier than Latin. So students are tempted to drift from one subject to another, taking a smattering of this and

a smattering of that, and getting no strong grasp of anything.

A few hints as to the value of various subjects are given in the following pages in the hope that they may guide you in arriving at a reasonable choice of studies, or strengthen your purpose when a choice has already been made. In connection with the discussion of some subjects there are also brief suggestions as to proper methods of studying in order to secure the best results.

WHAT TO STUDY AND HOW

I. WHY STUDY HISTORY?

“Histories make men wise.”

That it is greatly to the advantage of man for his brain to be highly developed is more than a mere truism. It is this development that enables him to add to his knowledge through the medium of words and even from the printed page. Other people can help him by their advice. He can thus guide his conduct by ideas and principles that come to him unverified by his own senses. In short, he can profit by the experience of others. All education is based upon this fact.

Profiting by the experience of others.

From their earliest years children refrain from doing what they learn to be harmful, and do that which they learn is pleasurable. Without such refraining and such acting they could not preserve their lives. They hear of some one who got in front of a street car, was run over, and killed or badly injured. They avoid the danger of street cars. They hear of some one who died from eating toadstools; and in consequence they avoid the poisonous mushroom. Some one says that thorn apples and the fruit of mandrakes are good to eat; and the child goes into the woods to find these wild fruits.

In childhood.

In the more complex situations of later life, — situations that involve proper social conduct, —

In youth.

we constantly hear young people making over the experiences of others into guide lines for themselves.

"Jennie did thus and so; and see what happened in her case."

"William tried to do some impossible thing, and had his trouble for his pains."

"It was thus that John made a fool of himself."

"Everyone is talking about Henry and how splendid he is; in such and such a situation he acted in this commendable way."

And from all these experiences of others, judgments are made and principles of conduct are formed that guide the youth into wiser behavior and enable him to shun folly and misfortune.

History is largely the study of behavior. From its pages the student can learn how men down the ages have conducted themselves in the complex and trying situations that have arisen. The test of time has passed a juster sentence upon their actions than can be passed upon the transient conduct of the student's associates; and the field of action is vastly enlarged. From history the teachable youth cannot help gathering wisdom to guide his own conduct in similar situations that arise as history repeats itself in various lines of behavior. For instance, it is hard to imagine a historical-minded man who would bolt and run in battle. He knows too well the consequences of such action. And, besides, nobler ideas have been set before him — ideas that consciously or unconsciously must rule his conduct. Treachery would be as impossible as uncontrolled cowardice. It is of no consequence

History enables people to profit from the experience of nations and of individuals.

whether he recalls specific instances of either from his history. The facts may have been forgotten so far as conscious memory is concerned. But they remain, subconsciously, if not consciously, the basis for everyday judgments and decisions as to personal conduct.

On the historian's page moral conduct, especially, is seen put to the test; and its results are spread before the student. Here sloth, cruelty, treachery, and cowardice reap their rewards. The king who could not forgive an enemy or win back a lost friend, gets himself beheaded at the last; the pleasure-loving prince loses his kingdom; and the cruel tyrant gets his return in hate, and falls by the avenger's knife. The pages of history contain examples also of the deeds of the good and the true. The courageous Leonidas by his own devoted death teaches victorious heroism to the Greeks; Peter the Great studies the arts of other kingdoms to apply them to his own; the persistent Washington, tireless and hopeful to the last, finally wrings victory from defeat.

Men are gregarious; like bees and ants, they live and work together. The success of the race is largely due to coöperation in industry, in government, in education, in effort of various kinds. All history enforces this truth.

All the social, political, religious, and economic institutions of the present day have grown out of the past; and unless we know the past, or at least know something of the origin and development of these institutions, we cannot fully understand

How history imparts wisdom as to right personal conduct.

As to social and political conduct.

them. The relations of one country with another, or the situation existing at any time between nations, whether of war or peace, cannot be appreciated or even understood except by one acquainted with the history of nations. The probable effect of any political movement or legislative measure at home can be known only by the statesman who is acquainted with the historical bias of his people. Such a one will know in advance how a measure may be regarded both at home and abroad; and what means or arguments must be applied to carry and enforce it. We see in Burke how greatly a knowledge of history may help a statesman. He saw how to avert the American Revolution. His speech on Conciliation has done more to keep the British Empire together since the American War than England's armies and warships have done.

Value of historical study to the practical reformer.

Historical study is especially valuable in a self-governing republic like ours, in which every man must be to some extent a statesman, able to form rational judgments on public matters. To the man with no historical background, events seem like the working of blind chance. The student of history alone sees reasons for what happens, and he alone is able intelligently to put his shoulder to the wheel of progress and help to move it in desirable directions. By reason of historical study he can become a more effective social worker and reformer. History makes for social efficiency and for wisdom in its broad sense.

There are usually four years of history offered in high schools. Ancient history comes first; then

medieval and modern history, the second year; English history, the third; and American history and civics, the fourth. Suppose a student has but a limited time to devote to history and must choose one or two courses only, what should he choose?

Advice as to what course in history to choose when but one or two years' work is possible.

If college is to follow the preparatory course, probably history in the high school should be taken up in chronological order, with ancient history given the preference when only a year's work is done. College work can fill up the gap. When a classical course is followed, ancient history should be taken early in the course. It will give meaning and interest to the Latin and Greek.

If college is not to follow high school, then first importance should be assigned to American history and civics in the senior year. If two years can be devoted to this study, let the second choice be European history, to precede the study of American history.

HOW TO STUDY HISTORY

First recall what you learned in the previous assignment. Then run over the title and subtitles of the topic you are about to study. If an outline of the topic is given in the table of contents, read it. Reflect to see if the titles and subtitles suggest answers to problems that came up in previous study, or to questions that occur to you now. See if you can recall ever having read anything on the subject. A few minutes spent in this preparatory work will do two things for you: (1) it will warm you up to the work by getting your brain cells active and

The value of preliminary reflection and recall.

whetting your curiosity and interest; and (2) it will enable you to grasp and retain what you read by associating the new ideas with the old.

Studying by
wholes.

Now read on through the whole assignment to get a complete outline of the topic. Do not stop before the end. You will thus link causes, results, likenesses, contrasts—whatever relations may exist; and in filling in the details later you will be able to appreciate the true value and significance of each detail because you see each in the light of the whole. This continuous reading will enable you (1) to get the connections and hence to remember the lesson better, and (2) to understand and appreciate the details.

Recalling as
you read
and outlin-
ing.

In the second reading stop to recall from paragraph to paragraph, and to reflect upon the thought conveyed, the events narrated, and the characters portrayed, passing your judgment on the conduct of the historical actors. Finally, make an outline or synopsis of the history lesson, grouping lesser details under the more important headings which they support. Run over this outline with your eye at a later time, perhaps just before going to class, and fill in by recalling in greater detail what is here only suggested. *Visualize the outline.*

II. WHY STUDY LATIN?¹

Latin has great value as a help in the development of an English vocabulary. A large part of our English vocabulary comes from Latin either directly or indirectly through the medium of Norman-French. The Latin words of our language are longer and more unusual than the Anglo-Saxon. Such words are valuable for the expression of more subtle and difficult thought, because, being less used, they are of narrower and more exact meaning. The study of Latin is thus a roundabout method of learning to read difficult English.

Latin increases the power to read and understand English.

The practice of translating from Latin into English is a direct method of learning to write and speak English. It is the only training in composition that the great English writers received. Only recently has English composition been taught in the public schools of England. The practice of translating gives accuracy and skill in the choice of words. To select from a half-dozen meanings and synonyms the right English equivalent for a Latin word requires a study of words in their nice shades of meaning, and such study proves of immense value to those who become writers or speakers. Thus Latin helps the student to acquire a larger English vocabulary and a more accurate and discriminating use of words.

Translation may be a good form of English composition.

¹ About the best brief for Latin that has appeared in recent years is that of H. Rushton Fairclough, "The Practical Bearing of Latin," *Classical Journal*, December, 1914.

Latin helpful in spelling, modern languages, and in historical interpretation.

A knowledge of this language is of advantage in several other directions. It helps in acquiring modern languages, more particularly French, Spanish, and Italian, which are derived from it. It is a decided help in the spelling of many English words of Latin origin. Such blunders as come from confusing *ible* and *able* or from writing *discribe* for *describe* are not likely to be made by Latin scholars. Finally, Latin gives a clearer understanding and appreciation of the history and civilization of the Roman people. Its value will readily be perceived when we come to know that only by contrast and comparison with the ancient civilizations, we can really see and understand the significant things in modern life.

HOW TO STUDY LATIN

To learn Latin requires in the first year or two a great deal of memory drill. The learning of forms and paradigms and the building up of a vocabulary necessitate a great deal of repetition. Here are a few rules which apply to drill work.

Principles of Drill

1. Distribute repetitions over several short sittings rather than one long one.
2. Repeat in rhythm, as in the synoptical verb endings:
o bam bo
i eram ero
 (Most forms and rules can be rhythmically chanted).
3. Stop short of fatigue; and cease all activity for five or ten minutes after completing an assignment, lest the new work inhibit fixing the old.
4. Practice at increasing intervals.

5. Go slowly at first to avoid mistakes. Every mistake in recall lengthens the time required to memorize.
6. Memorize by wholes rather than by sections to establish all the associations; but go back to special difficulties.
7. Establish all possible connections.
 - a. Recall your English grammar for comparison.
 - b. Recall English derivatives in learning vocabularies.
8. Study aloud or with lips moving.
9. Use multiple imagery; *i.e.*, write the forms, say the forms, and see the forms which you are memorizing.

Besides the drill work of the first year or two there will be much translating to be done from Latin authors. Cæsar, Cicero, and Virgil, perhaps also Nepos and Ovid, will be read in the secondary school. Here let us post a warning. Students are sometimes tempted to make use of literal translations in the preparation of their work. Avoid this error. Discontinue the study if you are unwilling to do the work necessary to translate for yourself. The "cribber" is doomed to early failure in the study of Latin.

The evil of leaning on literal translations.

Notwithstanding what has been said of the folly of using literal translations, the use of a free translation — such, for instance, as is found in that set of the classics published by Vincent Parke and Company — may be of much value. If you will read rapidly a free and spirited translation of Cæsar, Cicero, or Virgil in the summer vacation previous to the study of the author, you will increase your interest, understanding, and power.

Proper use of free translations.

Before beginning an assignment of translation, recall the thought of the previous passage; next translate at sight to get the general drift of the

Method of work in preparing an assignment.

author's thought. Now go back and look up the new words, testing for accuracy by judging whether the sentence makes good sense itself and is consistent with other sentences. As a final preparation, translate the whole passage aloud. Learn the common words thoroughly to avoid waste of time in turning to the vocabulary. Keep up a systematic study of grammar to get a connected view of the whole subject.

III. WHY STUDY ENGLISH?

Under the head English are usually grouped as many as five different related subjects. They are English literature, composition, grammar, rhetoric, and spelling. To these are often added oral reading and public speaking. Thus the question, "Why study English?" becomes complicated. Let us first ask —

Variety of work under heading of *English*.

WHY STUDY ENGLISH LITERATURE?

This very question has been asked of me more than once by hard-headed students who can find no utility in the artistic and purely ideal. There are persons who are tone deaf, and consequently unable to distinguish a note at one pitch from a note at another. To these, music is only noise. There are also persons who cannot distinguish one color from another. We call them color-blind; and we expect from them little appreciation of the work of great painters. Through some unaccountable defect there are those also who have no appreciation of the artistic in literature. There are people who do not like poetry of any kind and who never will like it. Artistic expression, conveying to most minds the delightful subtleties of rhythm, mood, and happily chosen words, conveys nothing but bald fact to them. They cannot see the utility of literature.

The artistic element in literature cannot be appreciated equally by all.

Happily these unfortunate ones are very few. In every course in literature the great majority of students find new springs of delight and need no further reason for studying it. Such pure pleasure

Ethical influence of literature.

is its own excuse for being. It is the poet's function to make beautiful the good, the heroic, the ideally true — to make them desirable to visions less inspired than his. Literature thus ennobles life. Nowhere in the school course can the old Latin proverb be quoted with more confidence of its truth: *Studia abeunt in mores* (Studies pass over into character).

Good novels are studies of human behavior, and effective models of expression.

Novel reading, if too much time is given to it, may become a vice. But in general the good novels are highly valuable. They give a better understanding of human nature, engender higher ideals, and, like history, afford a study of human behavior that becomes the subconscious basis of wiser personal conduct. Good novels employing the sterling words of everyday life are especially helpful in improving the student's own use of English. Foreign-born students from homes where no English is spoken often acquire style and vocabulary from the good authors that they read in school; and as a result they speak polished English. Observant teachers of English composition can nearly always see in their students' themes the good effect of some English author that is being studied and imitated at the time.

WHY STUDY ENGLISH GRAMMAR?

Tendency to imitate the speech of those about us.

In forming habits of speech imitation, as a rule, is more powerful than precept. With ease we fall into the use of the language of those about us; with difficulty we correct our speech through conscious study and effort. If those about us use good English, we use good English. If their English is

faulty, so will ours be faulty. It often happens that a person with incorrect habits of speech changes his place of living, falls in with cultivated people, gradually discards the solecisms and crudities of his earlier practice, and adopts a manner of speech like that of his new associates. If he returns to the home of his childhood, he quickly falls back into the old mistakes of grammar.

One advantage of grammar study is that it frees the student to a considerable extent from the influence of the incorrect speech habits of his associates. Many people try to test their grammar by "the way it sounds to them." Of course this is an adequate test if they are in the habit of hearing and speaking only correct English. But to the person who hears only "It is *me*," the correct form, "It is *I*," sounds wrong. In many ears, "You do that *good*" sounds more natural and better than "You do that *well*." A study of grammar gives fixed rules with which to test one's speech at any time, independently of habit or environment.

Incorrect grammar, like incorrect spelling, is always taken as a badge of inferiority. In these days of free and universal education, a man or woman who has never taken pains to acquire correct speech and spelling is set down as little above a defective.

(A good knowledge of English grammar is an excellent preparation for the study of any foreign language.) Grammar is a science with universal laws. Every language must have its direct object, its predicate noun or adjective, its phrases, participles,

Grammar gives a more reliable test for correct speech.

Poor grammar and spelling often regarded as badges of inferiority.

English grammar as a preparation for the study of foreign languages.

infinitives, and its dependent clauses, expressing various subordinate relations as in English. (It is far easier to learn a foreign language if you have thoroughly mastered English grammar.)

The study of grammar includes practice in analyzing English sentences. Analysis is a sure help to the reader in getting the thought from difficult passages. The thought can scarcely escape a reader who has learned to see quickly the substantive subject, the verb, and predicate of a sentence, and to discern the subordinate elements, either grouped as phrases and clauses, or modifying singly as adjectives and adverbs. Punctuation, too, becomes a valuable aid to the reader who knows grammar; and it is equally valuable to the writer.

Grammar leads to thought analysis and helps in the use of punctuation.

Summary.

Thus we see that the too frequently neglected subject of English grammar is really vital to the interests of every student. By it he is enabled (1) to make a better impression and to express himself more clearly; (2) to see more clearly the relations within the sentences he reads, and so more readily understand the thought; (3) to acquire a knowledge of the universal science of grammar so that he can, if occasion arises, learn a foreign language with comparative ease.

WHY STUDY COMPOSITION AND RHETORIC?

Composition and rhetoric include the practice and theory of writing effective English. Only a very few of the students in high school will ever make a living as authors; but all will find these studies

useful. They will add to the student's personal satisfaction, enable him to add to the pleasure of others, and increase his social and business efficiency, no matter what vocation he may follow.

No one can appreciate art so fully as he who has handled the artist's brush himself. No one can enjoy music so much as the one who has himself learned to play some instrument or to sing. Similarly, in regard to literature, if you are to get a maximum of enjoyment out of the master writers, you must make some progress as a writer yourself. There is also great satisfaction in having expressed something well. For the reward of composition, like that of all creative work, is a sense of personal satisfaction and enjoyment — the purest and noblest to be found.

So much for the personal gratification that skill in composition brings. It can add greatly to the happiness of others as well. I call frequently on parents whose son is a missionary in China. The son has had a university training in which special emphasis was laid upon English composition and rhetoric. He now writes home long letters on his life and work in that far-away land. His parents read again and again these clear and interesting letters. The neighbors come in to enjoy them. Their publication would, of course, greatly enlarge the number of readers; but even in the little circle of the home and immediate friends of the family they are decidedly worth while. It is inconceivable that any person trained in good English expression should go through life without adding by his

The writer gains appreciation and pleasure from exercise of the creative instinct.

The good writer can add greatly to the happiness of others.

letters to friends and relatives to the sum of their happiness; or that he should refuse to contribute papers to the clubs and associations to which he belongs, even if he never writes for publication.

There is an important field for good English expression in the business world today. A large part of the business of the world is done by correspondence. Merchandise worth millions of dollars is bought and sold every year by letter only. Letters tell how it is to be shipped, when, where, to whom, at what prices, and by what express companies or railways. Letters make complaints also, and clear up misunderstandings. Carelessness in the wording of these letters — lack of clearness and precision — sometimes results in heavy losses to merchants and shippers; for if mistakes are made in filling orders customers are dissatisfied and their patronage is lost.

To handle this vast correspondence thousands of young men and women are employed in our large cities. They must know how to write clear, concise, courteous, grammatical letters, properly spelled and punctuated. The letters must state clearly just what is meant, so that no costly mistakes shall occur. To insure clearness, and also to conserve the standing of the firm, the spelling and grammar must be correct. People do not trust ignorant business men; they prefer to do business with those whose correspondence reflects credit on their education and intelligence. The letters must be precise, which means short and to the point; for business men are always in a hurry, and have not time

Importance
of a good
business
letter.

Business
correspond-
ence opens
a wide field
of useful-
ness.

to read a single word more than is necessary. Finally the letters must be courteous in order to keep the good-will of those with whom the firm does business; otherwise trade will fall off. In fact, the spirit of the correspondence should reveal the high qualities of honorable business men. It follows that those young men and women who can be trusted to write good business letters are greatly in demand.

HOW TO STUDY ENGLISH

The question "Why study literature, grammar, spelling, composition, and rhetoric?" has been briefly answered. Now comes the question, "How study each of these branches of English?" The answer to the question, "How study English literature?" might well be this: Don't study it; just read and enjoy it. Attitude of mind is most important. A sense of leisure is needed; a mood of enjoyment, of abstraction from other things, so that the mind can be given fully to the reading. Let the mind picture the setting and see the characters; give the imagination full play.

Mood in which to enjoy literature.

It is well for the enthusiast early to form a companionship with some one equally fond of literature so that each may read aloud to the other those passages that each finds most delightful. Appreciation will be stimulated and pleasure enhanced by such joint voyages of discovery into the lands of literature.

Literary partnerships.

There remains only to repeat some of the points made in Part I. To enjoy the rhythm, emotional

When to
read aloud.

mood, and rhyme of poetry and of artistic prose, read it aloud. Again, if you wish the author's style and diction to influence your own, read aloud. It is well also to hear a trained reader whenever you can. Such a one will often reveal to you new beauties and meanings that you had never realized in your own reading. In order to get a connected view, read the whole play, poem, or story at a single sitting if you can. If it is too long for that, recall before reading what you read at a previous sitting. Mark the noteworthy passages for further reading and consideration.

HOW TO STUDY SPELLING

Where er-
rors occur.

Spelling is to be acquired almost wholly by pure feats of memorizing. Few rules are helpful; but these should at once be thoroughly learned. In addition, the rules for memory drill are about all that can be applied. A study of spelling tests reveals the fact that the greater the number of possibilities of error in a word the more frequently will the word be misspelled. These possibilities of error arise from the fact that in pronunciation we do not discriminate between soft *c* and *s*, nor between single and double letters as the *t*'s in *pity* or *witty*; nor do we discriminate the vowels in many unaccented syllables, as in *evident*, where the *i* has the same sound as that of the *e*'s. There are also many vowels and combinations of vowels that are pronounced alike, as in the sound of long *ē* which occurs in *meet*, *eat*, *key*, *chief*, *receive*, and *marine*.

Guarding
against
error by
noting
where errors
may occur.

The student will be helped by knowing these

more frequent vowels and vowel combinations that represent identical sounds in spelling. He will then be able to detect possibilities of error in a word, and can fortify himself against them. Besides the *e* sound noted above, he should watch for *ī* which appears in *hit*, *hymn*, *busy*, *women*, *pretty*, etc.; for *ā* which appears in *male*, *eight*, *straight*, *great*, *may*, etc.; for *ě* which appears in *met*, *bury*, *any*, *dead*, *said*, *Geoffrey*, etc.; for *ē* which occurs in *her*, *pearl*, *myrrh*, *sir*, *hurt*, *worse*, etc.; for the sound of *ū* in *up*, *come*, *does*, *blood*; the *â* and the obscure vowel which is very much like it in *portable*, *credible*, *collect*, *agent*, etc.; for *ō* in *show*, *beau*, *sew*, *dough*, *hoe*, *yeoman*, etc.; for *o* in *wolf*, *would*, *full*, and *book*; for *o* in *move*, *food*, *grew*, *truce*, etc.; for *ī* in *might*, *aisle*, *height*, *lie*, etc.; for *u* in *flute*, *brute*, *crude*, *suit*, etc.

We repeat here a few of the most important rules for spelling drill.

The principles of memory drill.

1. Use multiple imagery (i.e. pronounce carefully, spell aloud by syllable, write, and vocalize the word, observing the possibilities of error).
2. Repeat at increasing intervals (i.e. review tomorrow, skip a day and review, skip a week and review, skip a month and review).
3. Associate the spelling of as many words as possible, as when the *ie* in *believe* is associated with the *ie* in *lie*.

HOW TO STUDY GRAMMAR

The science of grammar is sufficiently organized to admit associating one fact or principle with another at every step. Associate the independent elements, subject, verb, and predicate word. Asso-

Make use of the principle of association.

ciate the dependent elements, both those that may stand alone (as adjective, adverb, and possessive), and those that occur in groups as phrases (prepositional, participial, infinitive), and as clauses.

Employ the method of discrimination with association.

Along with the association should go discrimination. Ask yourself such questions as these: How is an adverb like an adjective? How is it unlike an adjective? How is a phrase like a clause? How unlike a clause? How is a predicate noun like a direct object? How unlike a direct object? How is a participle like an infinitive? How unlike an infinitive?

The synopsis should be employed in studying grammar.

As fast as you cover ground make an outline or synopsis that associates the related things studied. For each part of speech or construction have an example to illustrate. To organize the materials of grammar in your mind by grouping all the details under the fewest possible main heads is the easiest way to remember them. Association and discrimination by similarities and contrasts is the easiest way to arrive at clear ideas regarding the parts of the sentence.

The material is of such importance that it warrants drill to drive it home. For this turn to page 94 where the principles of drill are given in full.

HOW TO STUDY RHETORIC AND COMPOSITION

Find applications of rhetorical principles in your reading.

The methods of study which have been applied to grammar apply equally well to rhetoric. Rhetoric is now generally studied with composition. It furnishes the theory and "rules of the game." An excellent practice is that of endeavoring to dis-

cover principles of rhetoric in one's prose reading. The practice fixes the principles more firmly in the mind, and gives them added significance for personal use.

In composition or theme writing it is important to choose as a subject that about which you know something and in which you are interested. If you know little or nothing of the subject assigned, inform yourself. Let the information remain a day or two in your mind before writing. In the meantime think about it in order to make the material your own, and to give it original color and interest.

When you have to write a theme on any subject, it is a good device to make an outline in advance. If a theme is due on the morrow make an outline of it tonight. Write it out in full tomorrow. New thoughts, perhaps adding greatly to the interest, will be likely to come to you in the meantime as a result of the outline; and they can be added in the final draft.

Few persons can sit down and write with ease from the moment they take up the pen. Usually a period of time is necessary "to get up steam." During this time think hard. *Keep writing* though you erase one false start after another. In this way you shut out all distracting thoughts which would occupy your mind if you should cease work. Presently, ideas will flow from your pen as fast as you can put them down.

Always read aloud what you have written. Awkwardness thus becomes apparent; you will keep

Great importance of knowledge of the subject chosen for composition.

Let thought on the subject precede writing.

How to get into the mood and swing for writing.

Test your style by reading aloud what you have written.

the same rhythm and swing, and your style will be more consistent throughout. After a pause in writing, go back and read what you have written, in order to get into the swing of thought and style again. Last of all be sure that you have made the best possible use of your knowledge of punctuation; check up the spelling of doubtful words by reference to the dictionary.

IV. WHY STUDY THE MODERN LANGUAGES?

By modern means of travel, the barriers of space have been conquered. Places now seem nearer than they did before we could journey by rail or by steamship; and the barriers of distance must continue to yield to improvement in means of transportation. The nations of the earth are no longer separated from one another as of old. These commonplaces are said here in order to stress the fact that foreign peoples are to be brought into still closer and more frequent contact with one another, and that there will be more need of the study of modern languages.

The world grows smaller.

The necessities of trade and foreign travel demand that foreign tongues be mastered. Moreover such study will increase our understanding and appreciation of foreign peoples. Foreign literature may become to us a source of light and inspiration. What there is of really great English literature may be read in a few years. When Shakespeare and the masters since his time have been exhausted, what a delight to be able to turn to Goethe, Schiller, Molière, Hugo, and Balzac! No translations exist that reflect the genius of such masters. To be fully appreciated they must be read in the original.

Foreign languages are useful in trade and travel and afford new fields of literary inspiration.

The knowledge of a European language is useful to leaders in the professions. If a man means to keep fully abreast of the times in any art or profession, he will wish to follow the German or French journals of scientific progress. As for Spanish, Americans will have a growing need of acquiring this

A modern European language necessary for leadership in the sciences and professions.

language as they come into closer trade relations with South American countries.

Necessity of serious purpose in order to acquire a language.

In spite of the real need for the study of foreign languages, many students are without sufficient purpose in the work. With some the study of a foreign language is a matter of fashion rather than of serious intention. To say a few words in German or French seems to them a badge of distinction; and that is all they carry away after years spent in classes studying these languages. Such sort of study should be discouraged. The fact is that it is exceedingly difficult to learn to speak and write a foreign language while resident in America. One must put his whole heart into it, going over and over again the forms, sentences, and idiomatic expressions. By no means undertake the task unless you fully expect to make use of the language.

HOW TO STUDY A FOREIGN LANGUAGE

The direct method.

Use the direct method. Read aloud, striving to get the thought from the foreign idiom direct, without the interference of English words. Apply every day to pictures and objects about you the new words acquired. Use the language in this way not once but twenty times a day; use it as you walk to and from school, as you sit at the table, as you talk with classmates, as you wake from sleep. On every occasion read aloud in the foreign tongue; go to hear plays and addresses in it; seek opportunities to speak with foreigners in their native language. Study carefully the rules for

memory drill given under the study of Latin and apply them here.

V. WHY STUDY MATHEMATICS?

In most high schools algebra and geometry are not elective but required subjects. The student, therefore, has no choice but to take them. All the more, then, is it incumbent upon the schools to make very clear the value of the work offered in these subjects. It is not a difficult task to make such a showing, for number and quantity relations necessarily enter into the everyday thinking of almost all men and women. Quantities of money are paid for quantities of goods and services: this is the great practical fact that forces mathematical thinking upon everyone.

Universal
need of skill
in numbers.

The contractor, engineer, builder, and business man think largely in numbers. Not long ago I overheard the conversation of two men who sat behind me in a railway coach; for two hours their talk was of quantities, weights, sizes, strains, loads, and values expressed in numbers. They are building contractors, to whom training in mathematics is indispensable. Mathematics is also essential to a proper grasp and use of the sciences. It is the application of mathematics to science that has given us our modern industrial progress. If you are to take physics and chemistry in the later years of your course, you should master algebra and geometry in advance.

Occupations where-
in the need
of such skill
is para-
mount.

“The ultimate needs of society and the present needs of the child must govern the selection of

A statement
by Karpin-
ski.

work in the high school as well as in the elementary school. How varied is the need of mathematical reasoning is shown by the numerous developments along mathematical lines in other fields, e.g., biometrics, mathematical chemistry, and mathematical physics. Analytical and graphical treatment of statistics is employed by the economist, the philanthropist, the business expert, the actuary, and even the physician, with the most surprisingly valuable results; while symbolic language involving mathematical methods has become a part of well-nigh every large business. The handling of pig-iron does not seem to offer any opportunity for mathematical application. Yet graphical and analytical treatment of the data from long-continued experiments with this material at Bethlehem, Pennsylvania, resulted in the discovery of the law that fatigue varies in proportion to a certain relation between the load and the periods of rest. Practical application of this law increased the amount handled by each man from twelve and a half to forty-seven tons per day. Such a study would have been impossible without preliminary acquaintance with the simple invariable elements of mathematics.”¹

HOW TO STUDY MATHEMATICS

Take time
to think;
nervous
haste is fatal
to good
work.

Avoid guess-work. Leisure is a prime requisite for the study of mathematics. Give yourself time to think. Many of the failures in this subject are due to haste. Students are in too great a

¹ Johnston *et al.*, *High School Education*, p. 134.

hurry to read and understand the problem before them; and in consequence they fail to grasp all the details. They fail to see just what is given in the data and what is called for in the solution. They are in so great a hurry that they do not think out how to apply in the solution of today's problem the mathematical principles previously acquired.

They rush into the operation and trust to luck that it will come out right; they do not take time to *know* at every step that the solution *must* come out right. Often they are satisfied if the result of an algebraic solution is a whole number; if it is a fraction, they work it out again by perhaps an entirely different process. The important thing is to proceed slowly and deliberately, letting thought and reason outrun the pencil and direct the work.

So much of the work in school is memory work that pupils are likely to endeavor to apply the same process to mathematics. But in this study reflection is the mental process most necessary. The method of trial and error, used in much practical investigation, is out of place in mathematics. In this subject one should not employ the experimental process of the puzzle or of the scientific problem.

In algebra take time to think out an accurate statement; then be sure of your arithmetical processes by going over additions and multiplications twice unless you are thoroughly confident of your accuracy. Do not try multiplication first and when that fails fly to division, as I have known some poor

Blind work is wasteful of time and energy.

Reason, not memory, is the faculty to guide.

Be sure of your work as you proceed.

students do. There is need of frequent review of the cases and formulas previously learned.

Be sure to see and understand all the data before proceeding to a solution.

In geometry an excellent method of finding out whether you have understood the theorem is to draw the figure independently of the book. Later turn to the figure in the book to see if your own work satisfies equally well the conditions of the theorem. Some of the best work done in geometry is done by those classes who use no book at all; and you may be sure that a large factor in their success comes from the necessity of reading carefully and understanding all of the conditions or data required for constructing an independent figure. The data thoroughly known, the solution generally follows.

Friendly competition is a source of added interest.

In no study can the principle of competition be more happily applied than in mathematics. Each problem has the fascination of a puzzle. Who can solve the greatest number of them? There are few students who have not felt the keen interest that such work excites. He who has not has missed the most stimulating and invigorating mental discipline that the school affords. Surely the power of concentration gained in an alert class in mathematics carries over into many a practical situation of after-life.

VI. WHY STUDY THE SCIENCES?

CHEMISTRY

As has been frequently pointed out, it is impossible to name anything in the world about us that chemistry does not help us to understand. The clothes we wear, the food we eat, the iron and steel that go into our machinery and tools, the bricks and mortar, the wood, tile, glass, and cement of our homes — the composition of all these comes under the domain of chemistry. The human body is a complex of chemical phenomena. Almost every function of the body has its explanation in chemical process. Chemical processes account for the growth and decay of all plants and animals. In short, the whole world of living things is dependent for life on chemical changes.

Universal-
ity of chem-
istry.

Chemistry shows how a few simple elements are put together to make up a world of different materials. It explains what happens in such changes as the burning of wood, the digestion and assimilation of food, the growth of plants, the rusting of iron, the rising of bread, and the dyeing of cloth. Chemistry broadens the interests of life in every direction.

Broadens
the inter-
ests.

Metallurgy is a department of chemistry. A knowledge of this subject made iron and steel production possible, as well as the production of tin, copper, silver, gold, and zinc. The chemist is

It is of im-
mense prac-
tical value.

necessary in the production of dyestuffs, soap, paint, sugar, glass, paper, ink, drugs, and fertilizers. The inspection of food and water is intrusted to the chemist.

A field open
for discovery.

An example
of this.

There are many problems in chemistry yet to be solved. Young men and women who come into touch with these problems early are likely to keep on in the great work of scientific discovery. A number of years ago a young student in Ohio read of the need of separating aluminium from its ore in a less costly way. At the age of twenty-two he had solved this problem. He gave us the use of aluminum ware. At his death, a short time ago, the papers devoted columns to this noted man, Charles Martin Hall. He died leaving a great fortune; but the wealth he acquired was only a small fraction of the wealth that he gave the world in reducing the cost of aluminum from ninety dollars a pound to eighteen cents.

Duncan's
plan at the
University
of Kansas.

This is by no means an isolated example of the valuable discoveries of chemists. In the University of Kansas various manufacturers have given sums of money to enable young students to support themselves while working on some chemical problem related to industry. The results of this work are gratifying to both manufacturer and chemist.

The student of chemistry can hope to apply his knowledge in the home, shop, factory, and farm in a hundred useful ways; and he can have the advantage of following the progress of the world by reading with interest and understanding numerous scientific articles and books.

PHYSICS

Some years ago a student of mine was obliged to seek a change of climate for his health. He went to Hawaii and found work as a laborer upon a large sugar plantation. Two years later he paid a visit to America, having become in the meantime manager of the plantation. You will be glad to read the story he told of his success.

Where a knowledge of physics proved valuable.

Soon after he reached Hawaii, a mill for crushing the cane was erected on the place. The erection of this machinery proved a task beyond the ability of manager and foreman; and no expert machinist was at hand. My young friend had studied physics in the high school, and his limited knowledge of mechanics, derived from that study, was enough to enable him to understand and direct the work. To the reputation for ability thus earned he owed his promotion from day laborer to manager.

Two other highly successful men who are engaged in electrical manufacturing business have told the author that their successful careers were opened to them by the study of high school physics. The wonderful work of Edison has been in the domains of physics and chemistry. The characteristic American traits of inquisitiveness and invention have splendid opportunities here.

Physics and the inventive faculty.

Aside from any vocational value that physics may have, it is the key to the interpretation of a vast number of everyday happenings. The swing of the pendulum, the projection and fall of the bullet, the rainbow's hues, the flash of the lightning

Some phenomena which physics explains.

and the crash of thunder, the steam-engine, the telescope, the microscope, the telephone and telegraph, the phonograph, the wireless, the X-ray, boiling water, congealing ice — manifestations of energy in ways too numerous to mention here — are all beautifully explained in the laws of physics. This study, like chemistry, has accomplished great things for the comfort, health, and happiness of mankind.

BIOLOGY

Botany and
zoölogy.

Biology is the study of living things. It is usually pursued as two separate subjects: botany, which is the study of plant life, and zoölogy, which is the study of animal life. Man himself is an animal and subject to the same laws of life that govern other animals.

Biological
study has
helped in
the fight
with
disease.

In recent years the study of botany and zoölogy has made very rich returns to the health, wealth, and happiness of mankind. It has been found that many diseases are caused by the development within the system of minute forms of parasitic life. A knowledge of these has already gone far toward wiping out yellow fever, hookworm, malaria, and other human diseases. The practical use of vaccination by Jenner is regarded by some as the greatest contribution to the welfare of the race that any man has ever made. During the eighteenth century fifty million Europeans died of smallpox. Vaccination has put a stop to this scourge. Plagues that frequently attack livestock and destroy millions of dollars worth of farm animals have in late years been checked by the biologists.

Pasteur, the eminent French scientist, saved his countrymen untold wealth by his discoveries. He saved cattle and sheep from a plague called anthrax, chickens from cholera, and human beings from hydrophobia. In the plant world Pasteur saved the vines and wines of France from diseased conditions that threatened ruin to this great industry.

The work of Pasteur and Jenner exhibits this.

Just now a fatal disease, which attacks the hoofs and mouths of cattle threatens to carry off millions of dollars worth of livestock. A great American scientist, Dr. Simon Flexner, of the Rockefeller Institute, New York, has been called to the Chicago stockyards in the hope that he may be able to discover the biology of this fatal disease and save the herds.

Entomology treats of insects. It is said that insects destroy about a billion dollars worth of crops every year in the United States. What a wonderful saving might be effected if every farmer could be an intelligent observer of these pests!

The loss caused by insect pests.

Not less valuable is the work of eminent botanists. Every young student should be encouraged to read the life of Luther Burbank. Through the breeding and selection of plants, this one man has added vastly to the wealth of all the world. He has improved old varieties of fruits, flowers, grasses, trees, and vegetables; has merged "wild or degenerate types of plant life with tame or cultivated ones, in order that the union may be of service to both"; and has actually created "new forms of life, unknown to the world before."¹ As a young man he

The wonderful work of Luther Burbank.

¹ Harwood, *New Creations in Plant Life*, p. 24.

created a new and improved variety of potato which became known as the Burbank. It is said that this one success has added over twenty millions of dollars to the wealth of the country.

New and improved species of plants.

Here are some of the things that this wonderful botanist has done. He has developed a thornless cactus which is a food for man and beast, and may be grown in the desert. He has made a new berry, called the primusberry, a union of the blackberry and the raspberry. From the apricot and the plum he has made a new fruit, called the plumcot. Other creations from the plum are (1) a plum with no pit, (2) a plum with the flavor of a Bartlett pear, and (3) one having a rare fragrance. He has taken the bitter taste of tannin from the walnut skin that covers the meat; has made a fast-growing tree, a daisy with a six-inch blossom, a dahlia with the odor of magnolia blossoms, a lily with the fragrance of violets, a chestnut tree that bears in eighteen months from the time of seed planting, a delicious white blackberry, a poppy with a ten-inch blossom, and a twelve-inch calla. He has greatly improved many species of fruits; among these is a prune three or four times as large as the ordinary French prune.

The study of botany should increase the number of Burbanks.

The work that Burbank has done, great as it is, is still only a beginning. It has blessed and enriched mankind immeasurably; still it is only pioneer work. When his example shall have stimulated a whole generation of ambitious young botanists introduced to the subject in our high schools, progress in this field should be still more rapid.

PHYSICAL GEOGRAPHY

The subject of physical geography treats of the physical sciences as applied to the earth. It is nature study with reference to inanimate nature. Biology treats of living things—plants and animals. Physiography treats of the forces and laws of nature as applied to material things, such as soils, rocks, mountains, valleys, rivers, lakes, and seas. It explains also such phenomena as winds, waves, tides, heat, cold, rain, ice, snow, frost, and dew.

The subject matter of physical geography is both interesting and useful.

There are two sides from which to view the value of this study: the cultural side and the economic side. Viewed from the cultural side physiography is seen to add to one's capacity for noble enjoyment. From the economic side it is seen to add to one's capacity to earn a living. Thus there is both pleasure and profit in the pursuit of this study.

To one gifted with natural curiosity there is a wealth of satisfaction in learning why so many things about us are as they are. The inquiring mind finds in physiography interesting answers to a large number of questions concerning the physical world. The subject gives interest to everything about us. As fact after fact is seen to fall under one or another law, we no longer inhabit chaos. The hill, the lake, the river, the ravine that catches our eye has a story to tell. Even changes of wind and weather are not the effect of blind chance. The very stones under our feet become eloquent of world history. Here is a huge one dropped from some vast glacier.

It enables the student to see the significance of common things.

Here is a sharp one that has been shattered by the power of frost. Here is one fused by volcanic heat. Here is one that has been rolled and polished by the action of waves. Here is one, picked up in northern Michigan, where long ago the coral polyps fashioned it, when this land was covered with a summer sea, stretching from the Gulf of Mexico. Thus new beauty and significance come to common things as we learn to understand them in the light of this science. Thought and conversation are enriched proportionately; and we are able both to read more understandingly and to grasp what we hear when the topic touches upon this science of physiography.

Industrial
utility of
this science.

So much for the cultural or pleasure-giving side of the study. The profit side is just as apparent. Training which makes men more observant of their environment makes it possible for them to take advantage of opportunities otherwise unseen. All occupations are conditioned by physical environment. The student of physiography, more than any one else, can tell the people of a locality what occupations they should pursue. He knows where to go to get the best returns for his labor in a particular line. Knowing the environmental conditions of a given place, he can judge how great a population can exist there, what animals and plants will thrive, and for what industries the place is best suited.

In many cases physical geography is given as a part of the general course in science required of all students in the freshman year of high school. From what has been said it can readily be seen that the requirement is made with good reason. The

subject is evidently of the first importance to every one.

HOW TO STUDY SCIENCE

Science gives an opportunity to study *things* at first hand rather than through the medium of books. The method of forming general ideas from facts gathered from observation is called the scientific method. The scientific method of study can be employed in business problems, and in any difficult situation of life, to very great advantage. Below is an outline showing how to make use of the scientific method in finding out a general truth.

The scientific method of research.

- I. State carefully the problem that you wish to solve.
- II. Consider a wide variety of data, and avoid the error of too hasty conclusions. Show energy and originality in your search for facts to serve as *data*.
- III. Observe carefully your data. Analyze them; i.e., examine them part by part. Look for likenesses and unlikenesses to find out what is typical and what is only accidental.
- IV. Guess at your theory in the light of your observations. Avoid the error of not considering facts that won't square with your theory.
- V. State your theory carefully.
- VI. Verify the theory by applying it to further data.

APPLICATION OF THE FOREGOING OUTLINE

Applying
the scientific
method.

- I. Statement of problem: *What causes the dew?*
- II. Variety of data.
 1. From first-hand observations made night and morning on weather conditions and dew by a high school student.
 - a. No dew after cloudy nights.
 - b. Dew after clear, still nights.
 - c. No dew after windy nights.
 - d. More dew in valley than on hilltops.
 - e. Little dew on tree tops; much on grass.
 - f. Much dew on ax blade, little on helve; ax blade feels colder than helve.
 - g. More dew on cool nights than on hot.
 - h. No dew on winter nights; frost in spring and fall.
 2. First-hand observations made by day on other deposits of moisture.
 - a. Water pitcher sweats when filled with cold water; does not sweat when filled with warm.
 - b. Hatchet blade sweats when brought from refrigerator; not when brought from oven.
 - c. Cellar wall sweats on warm spring day; feels cold to touch.
 - d. Rain falls when the wind changes and a cooler breeze strikes the clouds.
 - e. Water evaporates into the air; hence there must be moisture in the air.
 - f. Moisture on window panes on cool day, when house is warmer than air outside.
- III. Observation of data.
 - a. Unfavorable to dew: high places like hilltops and tree tops; wind, warm nights, winter nights, cloudy nights.
 - b. Favorable to dew: cool clear nights, low places, cool surfaces; summer weather.
 - c. Favorable to other deposits of moisture: cold water pitcher, cold hatchet blade, cold cellar wall, cool window-panes. Cool breeze (rainfall from).

IV. Theories and fancies.

1. The dew falls from the sky like a very fine mist. (Mother says, "Come in, children; the dew is falling.")
2. The dew sweats out of the ground as it does from a pitcher of icewater.
3. The dew comes from the breath of men and of animals and from steam and settles on things just as moisture in the house settles on window-panes.
4. Dew is moisture which the air gives up when it comes in contact with a cooler surface.

Now take up each of the theories in turn and see how it squares with the data or facts that have been observed and recorded. The first theory is that the dew falls from the sky like a very fine mist. The first fact observed is that there is no dew after cloudy nights. A fine mist is a fog, which would cause the sky to be overcast. Thus the very first fact is inconsistent with the theory. The second fact also refutes this theory; for there is dew after clear, still nights. Furthermore, the theory that dew falls does not account for the fact that there is no dew on windy nights. Again, if dew fell from the sky, as much would fall on hills and tree tops as on valleys and low places; as much on the ax helve as on the blade, etc. This first theory does not account for one of the facts given.

The second theory is based on a false assumption; for the water pitcher does not gather moisture by sweating, any more than does the cool hatchet blade. Neither the pitcher nor the hatchet has a system of sweat glands. Furthermore, it does not account for any of the facts.

The third theory does not account for 1a, 1d, 1f, 1g, 2a, 2b, 2c.

The fourth theory accounts for practically all of the phenomena observed. There is no dew after cloudy nights because the clouds act as a blanket to prevent the earth's surface from cooling to the dew point as it does on clear nights. Place your hand on the ground on such a night and see if it is not warmer than on clear nights. Winds do not allow the air to remain long enough in one place to cool and give up its moisture. The moving air of windy places, as on hills and tree tops, acts to reduce the amount of dew deposited there. The cold ax blade, water pitcher, cellar walls, and window-panes cause the warm air on them to give up its moisture just as the cool earth causes the dew. The cool wind on the clouds condenses their moisture into raindrops.

V. Therefore: Dew is moisture which the air gives up when it comes in contact with the surface of something cooler than the air.

VI. Verification. — Fill a polished metal beaker half full of lukewarm water. Stir it with a thermometer, adding bits of ice the while. Notice how the temperature gradually drops till the beaker is cool enough to make the air deposit moisture on its polished surface.

Vocational
value of
skill in
scientific
procedure.

Skill in the use of the scientific method will carry over to any commercial or industrial problem. Even today progress is largely dependent upon its use. See if you can follow the method as applied above and work out for yourself this problem: Why am I less successful in than is my friend? In the second blank fill in the name of a student. In the first blank fill in a study or accomplishment of any kind; or use such a problem as that of *winning friends* or of *earning money*.

VII. WHY STUDY ECONOMICS?

Economics treats of the production, distribution, and consumption of wealth. It is concerned with man's efforts to secure a living. Nearly every human institution has its economic side. This is true of education, and especially of government. Industrial history receives attention as the background of the subject; but modern industry also, and particularly the productive efforts of people in the student's own locality, come in for consideration.

The subject matter concerns man's efforts to make a living.

These are some of the topics usually studied in a course in economics: the organization of labor, occupations and the division of labor, efficiency, trade-unions, the problems of labor and capital, competition, competitive prices, monopoly and monopoly prices, interest, profits, money and coinage, banking, tariff and internal revenue, taxes, public ownership or control of means of production, public utilities such as railways, gas, water, telephone and telegraph companies, and the various forms of collective and individual use of wealth.

It covers a wide field of practical matters.

A mere enumeration of these topics shows that economics is a decidedly live and important subject of study. These are matters in which every citizen is interested. The student of economics will be not only a more intelligent voter, but he should also be a force to mold public opinion, and in industrial and commercial life he should be more capable of intelligent action and of organizing successful business.

It is of value to the voter and reformer as well as to the man engaged in making a living.

VIII. WHY STUDY PSYCHOLOGY?

Psychology is the science of mental life. It treats of feelings, sensations, understandings, reasonings and decisions, and the relation of mental processes to conduct. It investigates memory, will, attention, interest, suggestion, fatigue, habit, association of ideas, and all the phenomena by which the world becomes subject to consciousness. The physiological parts which are most intimately connected with mental acts or processes also receive attention; especially the brain, nerves, and the sense organs of sight, hearing, smell, touch, and taste.

Psychology
treats of the
mental life.

It is as use-
ful as is
physiology.

If it is worth while for men to study physiology and hygiene in order to understand their physical functions and to use and preserve their bodies in a state of efficiency, it is certainly worth while to study psychology in order to understand the mind and how best to use and preserve it in full vigor and usefulness. The principles of effective study in Part I of this book are based upon principles of psychology.

The subject
is much dis-
cussed and
little under-
stood.

At the present time there is wide interest in psychology and no wide knowledge of its truths. Hence many are being misled by the pretensions of pseudo-scientists and the wild utterances of charlatans. Especially is this true in the half-explored realms of subconscious phenomena. A great deal is being written and read about hypnotism, suggestion, the power of mind over matter,

clairvoyance, etc., that has no scientific foundation in fact.

A few days ago a young man came to me with a book published by a well-known Chicago firm. The book claims to have passed through innumerable editions, and the author's name is followed by learned titles. The work is full of the wildest statements; evidently it was written not to inform but to sell; yet the dear fellow who brought it to me had underlined much of it, committed whole pages to memory, and was making it a large part of his thinking and of his philosophy of life. I had him write to unquestioned scholars — professors of psychology at three universities — to get their opinion of the author and the book. Their replies were so unfavorable and so consistent that he readily saw that he had been made the victim of a fraud. The study of psychology would have put him on his guard in the beginning.

How the ignorant are duped.

The serious study of mental phenomena is not without interest and the knowledge gained is of value in many directions. Among other things, psychology is helping to an understanding of delinquency and crime; it is useful to the physician in the handling of certain types of nervous diseases; to the clergyman and social worker in knowing better how to influence the minds and conduct of others; and even to the business man in writing his advertisements and in selling his goods.

Practical value of a knowledge of psychology.

IX. WHY STUDY DRAWING?

Not all high school subjects need elucidation.

There are certain studies the subject-matter and value of which are so well known that it seems scarcely necessary to call attention to them here. Physiology and hygiene are examples. These subjects are taught in the grades and continued in the high school in an advanced form, usually with more detail and with more emphasis upon the experimental side.

Free-hand drawing and art are also subjects continued from earlier grades. Their great culture value in increasing the powers of observation and in stimulating taste and appreciation for the beautiful, should be pointed out long before the high school is entered.

The vocational value of drawing and art in giving value to industrial products.

Perhaps this is the place to call attention to the vocational value of drawing and art. One does not have to be an artist in order to make use of these studies. Every useful object of merchandise will find a more ready sale and will sell at a higher price if it has been fashioned in lines of beauty and embellished with attractive coloring. Pieces of furniture, rugs, carpets, dresses, hats, every article of apparel, also houses, wagons, and automobiles, all receive added value from symmetry and grace. Even plows, hoes, and steam engines, articles which are bought primarily for use, will give more satisfaction if they also please the eye. The producer in any line can win larger returns if he has cultivated

his sense of the beautiful. It is of decided advantage if to good taste there is added skill with brush and pencil so that the desired effect can be pictured in advance of production.

Invention is greatly aided by skill in freehand drawing. The order of procedure is this: first the idea; then the freehand drawing, next the working drawing, next the pattern in wood, and finally the completed article.

Mechanical drawing is a most useful art. It is indispensable in the building and manufacturing trades. Very often men are advanced to foremanships and other positions of responsibility solely because they can read and understand working drawings. Ability to make such drawings often enables one to improve processes of manufacture and to give greater value to the product.

Drafting is an occupation that calls for a considerable number of men expert in mechanical drawing. Young men often enter this occupation from high school and college courses. From it the ablest of them rise to become architects, builders, or manufacturers.

How drawing fosters invention.

Mechanical drawing as an aid in industry.

Mechanical drawing as a vocation.

X. VOCATIONAL STUDIES

STENOGRAPHY

A good stepping-stone to preferment.

Commercial work in the high school leads directly to many business openings, and afterward into avenues of promotion. Young men often feel that stenography is the province of women. On the contrary, no work affords a better opportunity to rise to managerial positions. Not long ago four men filling high places in railroad service sat down to dinner together at the Traffic Club in Chicago. In the course of the conversation it was revealed that each of the four had begun his career as a stenographer.

The private secretary.

The capable young stenographer becomes presently a private secretary to an official. He learns here the duties of that official. Intimate relations with a strong superior will give him not only excellent training, but also opportunity to show his own worth and to win the confidence of one in whose power it generally lies to recommend or promote to positions of responsibility.

What is true in this respect of railroading is also true of other business. The wider the training and education that a secretary has, the more valuable his services. A good technical education, coupled with literary skill, is especially valuable in the offices of industrial corporations. A knowledge of business law, commercial geography, book-keeping, and commercial arithmetic are valuable in every office.

Many people are misinformed as to the amount of education needed by stenographers. Largely responsible for this condition are the so-called *business colleges* with their six-months' courses to which they attract grammar school graduates. The young stenographer who cannot understand the matter she is taking from dictation will not be able to read her notes when they become cold; much less will she be able to paragraph, punctuate, and spell them correctly. Such a one must in these days of competition expect in most instances to be dismissed from one position after another, until, perchance, she has picked up enough general information and enough English to earn fifty dollars a month and satisfy her employer. On the other hand, women of education and ability are found who have been promoted to positions as private secretaries at salaries as high as three and four thousand a year.

Value of a good general education for stenographers.

BOOKKEEPING

Bookkeeping is also a good opening for young men desiring to enter commercial lines. To the possessor of real mathematical talent, organizing ability, and experience, there are open such positions as those of head bookkeeper, auditor, and controller of great business enterprises. Certified public accountants are expert bookkeepers who have passed certain state examinations. Many of them go into business for themselves, and are employed by public and private corporations to examine their books of accounts and make a report to the

Possibilities of promotion for book-keepers.

public or to the stockholders on their accuracy and on the financial state of the corporation.

Disadvan-
tages.

Men who remain in the subordinate position of a bookkeeper soon reach the limit of their earning capacity at a salary of from fifteen to twenty dollars a week. They do not meet the public, do not direct the work of others, or assume large responsibility. In consequence, if they remain too long at the bookkeeping desk they are likely to be incapacitated for positions which involve broader duties and greater responsibilities. Yet many managers and employers have been developed from alert young bookkeepers who have learned much about the details of business. In large banks and offices, where there is a minute division of labor, a bookkeeper will learn less than in smaller offices unless he manages to be transferred from one desk and one set of books to another. The expert who becomes an auditor, public accountant, comptroller, or the like, can rise to a salary of three to five thousand dollars a year, and in some cases to even more.

SALESMANSHIP

Why the
salesman is
highly paid.

The work of a salesman is usually more highly paid than that of other employees such as clerks and bookkeepers. The life of the business is immediately dependent upon the sale of goods. The traveling salesman who can go out and get business, and thus enlarge the profits of the concern for which he sells, is in a position to demand a good salary. The salesman behind a counter, to whom customers come, will earn less than the traveling

salesman; but success even here is rewarded by increased pay. The clerk or bookkeeper who looks after routine duties which are fixed and easily within the capacity of average men, has little chance to display energy and ability, and to increase his earnings. The salesman is not so confined; the more he can sell the more he can earn.

Salesmanship is an art which may be learned as well as a gift which is inborn. Success will depend in part upon one's knowledge of human nature, and upon one's knowledge of the goods he is selling and of competing goods. But in large measure qualities of character will determine one's earning capacity as a salesman. In the first place the ability to meet and deal with men is all-important. Boys who are poor students because they like people more than they like books, and prefer always to be in the company of others rather than alone with their studies, may make excellent salesmen. They are popular in school; they make friends easily; they are never embarrassed in conversation; and they quickly win the confidence of others. Above all, the salesman must win confidence. If he is honest and upright, his personality will indicate honesty and uprightness and will inspire confidence. If he likes other people, others will like and trust him. Intelligence and good sense are of course elements of success in the work of a salesman as in everything else.

Traits of a
good sales-
man.

College men are going into salesmanship with marked success. The wide and intimate knowledge of men, gained in college, and the ability to meet

College men
as salesmen.

strangers and to make friends are decidedly valuable. Poise, self-confidence, and distinction of manner are not the only advantages gained in college; education gives a many-sided interest and knowledge of things, and opens many avenues of approach in meeting customers and varied topics of conversation in winning them.

SCIENTIFIC FARMING

Who should
choose
farming as a
vocation.

The sciences afford an excellent preparation for *agriculture*. Botany, zoölogy (including entomology), physical geography, chemistry, and physics all bear more or less directly upon the science of agriculture. The student who is fond of botany and zoölogy, who loves nature and is happy to find himself alone with growing plants and animals, will surely enjoy this vocation and succeed in it.

Value of
education to
the farmer.

Education certainly pays as a farmer's investment. An agricultural survey of Tompkins County, New York, shows that farmers who have attended high school are making more than twice as much money returns on their labor as is made by those who have merely attended a grade school. It would be interesting to compare the financial returns of those scientifically trained with the returns of those high school men who have had no scientific training. Every farm is a laboratory for scientific experiment. Problems of soil conditions and the crop best adapted to these conditions, of the most suitable fertilizers, of the best preparation of the soil, of the most economical methods of feeding stock, of the choice of what stock to sell and what to keep and

breed, of the care of trees and the shipping of fruit—all these problems call for intelligence and scientific management of a high order.

I know of a Michigan farmer with a hundred and sixty acres whose profits average twenty-five thousand dollars a year. His knowledge of fruit, soil, and fertilizers is remarkable. Near by are other farmers with inferior equipment who drudge for a scant living on farms of equal size.

In many high schools it is possible to take a course in agriculture. A young man from the town should follow up this course with a summer vacation at work on a farm, and thus test his adaptability for this sort of work. A college course in some school of agriculture pays large returns to the practical farmer. Certain lighter branches of farming, such as poultry raising, dairying, the keeping of bees, and the raising of flowers and garden vegetables are as well suited to women as to men.

High school and university courses in agriculture.

DOMESTIC ART AND SCIENCE

Dressmaking, millinery, and laundry work are vocational fields of wide scope, in which a capable student can hope easily to pass from employee to employer. Tailoring and textile study for men should have a place in the same department.

Cooking offers another wide field; and there is no reason why both young men and women, trained in our high schools, should not enter the profitable field which the skilful preparation and serving of foods opens to them in all populous centers. Of

course service under the direction of others should precede independent business careers. Lack of capital should not deter the student. A man of high position in financial affairs once said to the writer, "It is ridiculously easy for a young man with a good reputation to borrow the capital with which to start in any business which he knows and knows to be fairly profitable."

MANUAL TRAINING

Manual training opens a wide field to young men who show natural aptitude in mechanical lines. For the engineering professions a college training is required, or is at least highly desirable.

THE PROFESSIONAL ENGINEERS

The profession of engineering includes many special departments :

(1) The civil engineer, who designs and builds stable structures such as bridges, embankments, walls, buildings, or attends to the surveying of land and railroads, and to the maintenance of railways.

(2) The mechanical engineer, who designs, builds, and sells engines and machines.

(3) The electrical engineer, who designs, builds, tests, and operates electrical machinery and electrical plants.

(4) The hydraulic engineer, who designs, constructs, and operates water-works for towns and cities; canals, reservoirs, and dams for irrigation;

canals and ditches for drainage; and improvements in rivers and harbors.

(3) The sanitary engineer, who is employed by cities to design and construct sewer systems and plants for the purification of sewage.

(6) The municipal engineer, who is charged with the designing, constructing and upkeep of streets, of municipal water-works, and of sewer systems, getting advice from the sanitary and hydraulic engineers.

(7) The mining engineer.

All the technical knowledge a man can get in a four, five, or six years' course after high school is required for success in engineering. Yet the character requirement is after all the most fundamental. Without this a man must fail in engineering as in all other professions. Here are the specifications for a good engineer, found in Chief Engineer Sterling's Report to the Mississippi Levee Commissioners:

Require-
ments of a
good engi-
neer.

"A good engineer must be of inflexible integrity, sober, truthful, accurate, resolute, discreet, of cool and sound judgment, must have command of his temper, must have courage to resist and repel attempts at intimidation, a firmness that is proof against solicitation, flattery, or improper bias of any kind, must take an interest in his work, must be energetic, quick to decide, prompt to act, must be fair and impartial as a judge on the bench, must have experience in his work and dealing with men, which implies some maturity of years, must have business habits and knowledge of accounts."¹

¹ McCullough, *Engineering as a Vocation*.

The position of stationary engineer is one calling for a responsible man with comparatively little expert knowledge and skill. The work is quite easily learned and the stationary engineer is usually paid twice as much as the average clerk.

ENGINEERING AND BUILDING TRADES

The engineering trades include those of machinists, mill-wrights, draftsmen, blacksmiths, foundry workers, and pattern-makers. These are all skilled laborers who have usually served apprenticeship and are paid from three to five dollars a day.

The building trades include those of the carpenter, mason, plasterer, plumber, electrician, structural ironworker, steam-fitter, gas-fitter, lather, mill-man, sheet-metal worker, cabinet-maker, glazier, cement worker, painter, and decorator.

How men in these trades sometimes rise to great fortune.

In the engineering trades there is possibility of rising to fortune by a successful invention, protected by patent; or by passing from the ranks of employee to employer, often through the positions of foreman and superintendent. The general superintendent of a great plant is usually a very highly paid man; and he may be given a share in the profits. In the building trades there is always the possibility of promotion to foreman or superintendent; and from these managerial positions men of initiative meet with little difficulty in going into business for themselves as building contractors.

In addition to those already enumerated, there are several other lines which a young man of me-

chanical tastes may pursue — such as general contracting, excavating, road-making, and lumbering.

In these and all other occupations which a youth considers entering, there are certain questions which ought to be answered before choice is made:

Questions to ask before choosing a trade.

1. What qualities are necessary for success?
2. Have I these qualities?
3. What education or special training should I have?
4. What opportunities does the occupation afford to serve others or to benefit society?
5. What opportunities are there for advancement to more responsible and more highly paid work?
6. Am I building the character that can be entrusted with this responsibility?
7. What is the extent of the field of employment?
What demand for the goods or services?
Are there many idle men in the given occupation?
Are there civil service as well as competitive openings?
8. What is the healthfulness of the employment?
Is there danger of occupational disease?
Have I the strength and health for this work?
9. What location is most desirable?
Am I willing to live in the necessary location?
10. What trade-union regulations must be met?

XI. THE OLDER PROFESSIONS

THE PHYSICIAN

How to
learn
whether
you have a
taste for the
medical
profession.

The sciences, particularly physiology and zoölogy, give an excellent approach to the study and practice of medicine. A good high school course in these branches should make it possible for a student to discover whether or not he is likely to become interested in this profession. If these subjects do not appeal to him, probably medicine and surgery will not appeal to him.

What physi-
cians say of
their profes-
sion.

Some time ago I sent a number of question blanks to physicians in order to get information concerning their profession. For the benefit of those who may be considering medicine as a vocation I print one of these blanks with answers, filled in by two physicians. Their answers are numbered 1 and 2 respectively in reply to each question. Number 1 is a successful family physician in a town of 6,000 inhabitants. Number 2 is an eminent physician and surgeon with a national reputation.

1. Is the profession of medicine overcrowded?

1. Statistics show that 5,000 physicians graduate annually in the U. S. where 2,000 are required.
2. No.

Is it likely to be in the near future?

1. Yes.¹
2. Not likely to be in the upper stories for many years.

¹ Others say that higher educational requirements are reducing the number of physicians, and assuring a better future for the profession.

2. Are there too many specialists?

1. In general, yes; of good ones, no.
2. Yes. In leaving college they should first have a general training.

3. What qualities are preëminent in those physicians who meet the greatest success?

1. Intellectual ability. A pleasant, wholesome personality. Self-confidence, energy, a studious nature, and, above all, good sense and a sympathetic nature.
2. Inexhaustible energy, indefatigable zeal, sterling integrity and fidelity to purpose.

4. What is the cause of failure?

1. Deficient intellect, lack of preparation, and lack of study cause failure in a strict professional sense. Ignorance, and a displeasing personality which does not convey confidence, cause practical failure.
2. Indolence; incapacity for grasping such a broad and deep subject; generosity in the waste of time, and procrastination.

5. What do you estimate the average family physician's income to be?

1. \$700.00.
2. About \$1,500.00 per year.

6. Is the income of the specialist usually better?

1. As a rule, yes.
2. Yes.

7. What is the largest income you know of in either medicine or surgery?

1. In Chicago and other large cities about \$100,000.00; there are some larger.
2. \$13,000.00 a month. (\$156,000.00 a year.)

8. How long does it ordinarily take a physician to establish a practice?

1. This cannot be answered. Some win success immediately; others never; all depends on location, competition, and individual ability.

2. Seven years.

9. Does a more paying practice usually follow greater experience or is a limit reached after a few years?

1. Should increase up to 60 or 65 years of age, in fact as long as a man keeps pace with the advance of medical science.

2. Greater experience, with continued study and application.

10. Is a college course before the professional school financially profitable?

1. Absolutely essential; entrance requirements to all well recognized medical colleges practically demand it.

2. Yes and No. First, a man who is taught to think profits by a college education. Second, a mere bookworm is injured by a college education.

11. How many years of professional training should a physician have?

1. Five years in medical college, and if possible three in a hospital.

2. A four-year course in college and two years in hospital.

12. What location offers the best field, country, city, or small town?

1. All depends on the individual, whether he is by nature and cultivation suited (from a social standard) to live and work among the more polished classes or whether his nature and talents adapt him better to more rugged work among rural classes. *In general* the medical profession like all others is overcrowded with men who are practical failures. There is always room for the progressive man of energy and ability. I believe the medical profession offers good opportunity to the latter class.

2. That depends on the man very much, but good qualifications win in every field. In the cities the average is generally estimated at from \$1000 to \$1200.

THE DENTIST

Dentistry is a profession related to medicine and surgery. To interest in physiology the student should combine some mechanical skill. Below is given a typical answer received from an inquiry sent to dentists. Evidently this useful profession is in no danger of immediate overcrowding. The dentist.

1. Is the profession of dentistry overcrowded?

No.

Is it likely to be in the near future?

I think not. The demand for dentistry is increasing with education as to the evil effects of bad teeth. The supply of dentists is diminishing with higher standards as to educational requirements.

2. What qualities are preëminent in those dentists who meet with the greatest success?

Good character; pleasing, attractive personality; ability to meet and deal with people; conscientious effort to do one's best.

3. What is the cause of failure?

Poor work largely. Negligence, lack of skill, lack of effort, poor personality.

4. What do you estimate the average dentist's income to be?

\$1500 to \$2000.

5. What is the largest income you know of?

\$20,000 in large cities.

6. How long does it ordinarily take a dentist to establish a practice?

One to three years.

7. Does a more paying practice usually follow greater experience or is a limit reached after a few years?

Usually increases.

8. Is a college course before the professional school financially profitable?

Yes.

9. How many years of professional training should a dentist have?

Three.

10. What location offers the best field, country, city, or small town?

The best field in which to begin practice is probably a place of about 10,000 inhabitants; the large city affords opportunity for the best talents to secure fees proportioned to ability.

11. *Remarks.*—In the cities specialists doing only one branch of dentistry are found.

THE PHARMACIST

The pharmacist.

Chemistry in the high school offers an excellent "tryout" for the would-be pharmacist. Many high school students who expect to enter this occupation manage to find work in drug stores on Saturdays and during vacations and even after school hours when school is in session. Below is a typical reply to questions asked concerning this occupation.

1. Is the profession of pharmacy overcrowded?

Not with efficient men.

Is it likely to be in the near future?

No. As educational requirements are raised the opportunity will be greater.

2. What qualities are preëminent in those pharmacists who meet with the greatest success?

Thoroughly qualified either by experience or a course in a reliable College of Pharmacy. Must have knowledge of business and ability to handle people.

3. What is the cause of failure?

Lack of the above, and causes that would apply in all businesses and professions.

4. What do you estimate the average pharmacist's income to be?

\$18 to \$35 per week.

5. What is the largest income of which you know in pharmacy?

\$20,000 per year.

6. Should the young pharmacist look forward to becoming proprietor of a drug store?

I should advise a young man never to enter pharmacy, unless his aim is some day to have a store of his own.

7. Are there too many drug stores?

No; except, perhaps, in certain localities.

8. What location offers the best field for a druggist to-day? City or country town?

Medium size country towns without too much competition and new sections of large cities are usually the best places for a young man to start.

THE LAWYER

The law as
a profession.

History, Latin, and English are the important subjects which may be said to give pre-vocational training to the lawyer; yet indeed every subject is useful to him, including mathematics, the sciences, and even commercial branches and manual training. Law cases involve subject-matter of the greatest variety; and the lawyer can scarcely cover too wide a course in his preparation. Some of the most successful lawyers never appear in court and are seldom called on to speak in public; yet the good public speaker will have an opportunity to become known, and popularity is of great advantage in building up a practice. Below are given two replies to questions sent to lawyers. The two lawyers answering are numbered 1 and 2, respectively, after each question.

1. Is the profession of law overcrowded?

1. Yes (with those naturally unfitted, or untrained, or unequipped).

2. Not with men of even fair ability.

Is it likely to be overcrowded in the near future?

1. Yes.

2. Not with men of even fair ability.

2. Are there many men with legal training who do not practice law?

1. Yes.

2. No.

If so, why?

1. Other vocations offer larger emoluments, present competence, health.

2. (No answer).

3. Is the study of law a good preparation for business life?

1. Yes.¹

2. No.

4. What qualities are preëminent in those who meet with the greatest success?

1. Natural gifts, perseverance, force, integrity, industry, courage, accuracy, exactness, precision, sound judgment.

2. Organizing and executive power, coupled with social presence and success for the adviser of business interests. Analytical powers, and a fine voice and presence in the handling of litigated problems in the courts.

5. What is the cause of failure?

1. Natural unfitness, lack of training, sloth, unreliability, negligence.

2. Lack of the above (See Ans. 2 to Q. 4, above) together with lack of manners and address of a gentlemen, lack of courage, and shiftlessness.

6. Should a man apply himself to a specialty in the law?

1. Yes.

2. He should choose between being an adviser to business interests and handling litigation in the courts.

7. What are these specialties?

1. Commercial, corporation, patent, equity, trusts, probate, real estate, consulting, trial of cases.

2. See under 4 above.

8. Does each call for special talents? If so, explain.

1. Yes. As in any business or profession in life, special or natural adaptability or "talent" promises best.

2. Yes. I have already explained under 4.

¹ The answers to this question are generally in the negative.

9. What do you estimate the average lawyer's income to be?

1. Wide range, \$3000 to \$10,000.¹
2. \$3000 per year.¹

10. What can an average graduate of college and law school expect to earn at the law the first year, working for himself or for others?

1. \$500 to \$1500.
2. \$500 to \$1000.

What the tenth year? ²

1. \$3000 to \$6000.
2. \$3000 to \$6000.

¹ These estimates are higher than usually made. Many regard \$1500 as a fair average.

² "In the *Harvard Law Review* for January there is an article addressed especially to young lawyers, but full of interest and suggestion for many other classes of readers. It is called 'Suggestions from Law School Graduates as to where and how to begin Practice.' It is written by Richard Ames, secretary of the Harvard Law School, and is based directly upon the 817 answers received from a questionnaire issued to the 1692 men who graduated from the School in the ten years preceding 1912. The more important questions were these: 1. 'What (as nearly as you can estimate it) have been your net earnings from law each year since graduation?' 2. 'Have you any suggestions to offer to students about to graduate that might be helpful to them in deciding where to locate and under what conditions to begin practice?'

"The table of average earnings made up from the answers to the first of these questions contains many interesting points. In general the average was \$664 for the first year, \$5,325 for the tenth. In New England the first year's earnings averaged \$524, in Boston, \$495; outside New England, \$753, in New York, \$720; east of the Mississippi, \$664, west of the Mississippi, \$808; in cities over 100,000, \$643; in cities under

What the twentieth year?

1. \$5000 to \$12,000. No satisfactory averages can be given. Exceptions numerous. Ranges very wide.

2. \$10,000.

11. Does a more paying practice usually follow greater experience or is a limit reached after a few years?

1. Yes, in the absence of questions of health, panics, local changes, other reasons.

2. (No answer).

12. Is a college course before the professional school financially profitable?

1. Yes, it should be; but there are many exceptions.

2. It certainly is.

13. What location offers the best field, town or great city?

1. City, for remuneration. Town, for relative position in the community. Small cities or county seats, for comfortable remuneration and political preferment.

2. The largest center of population; provided always you enter by the proper door, and do not blindly plunge yourself into it.

100,000, \$783. In the eighth year out — the last for which the averages are given by localities — the men in New England report \$3,902, in Boston, \$4,266; outside New England, \$4,765; in New York, \$4,210; east of the Mississippi, \$4,540; west of the Mississippi, \$4,010; in cities over 100,000, \$4,551; in cities under 100,000, \$3,550." — *Harvard Alumni Bulletin*,

Feb. 11, 1914.

XII. WHAT IS EFFICIENCY?

How shall we account for the great difference between the income of the average medical practitioner with perhaps \$1200 a year and that of the distinguished physician with \$150,000 a year, — between the average lawyer's income of perhaps \$1500 and the great lawyer's of \$100,000? These differences in earnings represent very largely the differences in ability and character. In general, given equal desire for wealth, *income measures efficiency, i.e. mental and social power.*

Evolution or the *upward progress* of man has come about by the development of power chiefly in two directions: (1) *Brain-power*, or the power to think effectively and to work with active mind; (2) *Social power*, or the power so to regulate one's actions, character, and habits as to live and work harmoniously with other people. Brain power and social power are indicated by certain good qualities of mind and character.

Qualities that have made the race of men superior to all other forms of animal life will also insure the success of the individual among other men, whenever the individual is preëminently the possessor of these good qualities. The winning qualities and their opposites are listed on the following pages.

MENTAL POWER

I. Mental Power is revealed in *traits of judgment*; as when a person is

- | | |
|--|--|
| 1. <i>Reasonable</i> , not unreasonable. | 5. <i>Practical</i> , not impractical. |
| 2. <i>Teachable</i> , not obdurate. | 6. <i>Well-balanced</i> , not unbalanced. |
| 3. <i>Deliberate</i> , not hasty. | 7. <i>Shrewd</i> , not easily imposed on. |
| 4. <i>Sensible</i> , not foolish. | 8. <i>Foresighted</i> , not without foresight. |

II. Mental power is revealed in *attitude of mind*; as when a person is

- | | |
|---|--|
| 1. <i>Alert</i> , not dull or absent-minded. | 5. <i>Earnest</i> , not indifferent. |
| 2. <i>Attentive</i> , not inattentive. | 6. <i>Active</i> , not passive. |
| 3. <i>Alive and wide-awake</i> , not apathetic. | 7. <i>Quick</i> , not slow. |
| 4. <i>Serene</i> , not nervous. | 8. <i>Interested</i> , not without interest. |

III. Mental power is revealed in *methods of work*; as when a person is

- | | |
|--|---|
| 1. <i>Prompt</i> , not dilatory. | 7. <i>Thorough</i> , not slipshod. |
| 2. <i>Reliable</i> , not unreliable. | 8. <i>Industrious</i> , not idle. |
| 3. <i>Careful</i> , not careless. | 9. <i>Hardworking</i> , not lazy. |
| 4. <i>Painstaking</i> , not reckless. | 10. <i>Persistent</i> , not changeable. |
| 5. <i>Steady</i> , not intermittent. | 11. <i>Orderly</i> , not disorderly. |
| 6. <i>Systematic</i> , not unsystematic. | 12. <i>Saving</i> , not wasteful. |

IV. Mental power is revealed in *traits of courage*; as when one is

- | | |
|--|--|
| 1. <i>Self-possessed</i> , not self-conscious. | 3. <i>Confident</i> , not distrustful of self. |
| 2. <i>Self-reliant</i> , not timid. | 4. <i>Courageous</i> , not fearful. |

SOCIAL POWER

I. Social power is revealed in *social traits*; as when one is

- | | |
|--|--|
| 1. <i>Unselfish</i> , not selfish. | 11. <i>Gentle</i> , not stern. |
| 2. <i>Sociable</i> , not unsociable. | 12. <i>Democratic</i> , not snobbish. |
| 3. <i>Talkative</i> , not taciturn. | 13. <i>Coöperative</i> , not combative. |
| 4. <i>Well-spoken</i> , not gossipy. | 14. <i>Steadfast</i> , not treacherous. |
| 5. <i>Generous</i> , not avaricious. | 15. <i>Trustful</i> , not suspicious. |
| 6. <i>Benevolent</i> , not close-fisted. | 16. <i>Noble-hearted</i> , not jealous. |
| 7. <i>Cheery</i> , not sour. | 17. <i>Reverent</i> , not irreverent. |
| 8. <i>Optimistic</i> , not pessimistic. | 18. <i>Honorable</i> , not dishonorable. |
| 9. <i>Contented</i> , not envious. | 19. <i>High-minded</i> , not base. |
| 10. <i>Quiet</i> , not noisy. | |

II. Social power is revealed in *attitude toward truth*; as when a person is

- | | |
|--|--|
| 1. <i>Honest</i> , not dishonest. | 5. <i>Square</i> , not unfair. |
| 2. <i>Truthful</i> , not untruthful. | 6. <i>Just</i> , not unjust. |
| 3. <i>Candid and frank</i> , not deceitful. | 7. <i>Trustworthy</i> , not untrustworthy. |
| 4. <i>Conscientious</i> , not unconscientious. | |

III. Social power is revealed in *qualities of heart*; as when a person is

- | | |
|---|---|
| 1. <i>Modest</i> , not vain. | 6. <i>Thoughtful of others</i> , not boorish. |
| 2. <i>Kindly</i> , not cruel. | 7. <i>Courteous</i> , not discourteous. |
| 3. <i>Hearty</i> , not cold. | 8. <i>Sympathetic</i> , not unsympathetic. |
| 4. <i>Cordial</i> , not indifferent. | 9. <i>Affectionate</i> , not unaffectionate. |
| 5. <i>Respectful</i> , not disrespectful. | 10. <i>Loving</i> , not antagonistic. |

The Positive Qualities named above are in line with upward progress; their opposites with degeneracy. "Think on these things." Utter such desires as these: "I want to be *honest*." "I want to be *alert* and *attentive*." "I want to be *unselfish*."

The Positive are godlike qualities, won by following the noblest impulses and by efforts to do right; the Negative survive from the low instincts of primitive men and animals, and often come without willing. The Positive is for the "Success Club;" the Negative for "drifters" and the "Down-and-Out Club."

High school and college life is rich in opportunity to develop power both for mental work and for social life. Where high social qualities predominate school spirit runs high. Where high mental qualities predominate excellent work results.

Let us make a further study of the reasons why incomes vary to such a wide extent. Economists use the term *wages* to designate the reward given by society to all kinds of labor; and *labor* in the language of economists is used to designate all sorts of work, mental or physical, including that of professional men and superintendents as well as that of day laborers. Now it is necessary to distinguish between real wages and money wages. The latter are measured in dollars and cents only; the former are measured by the amount of comfort and luxury that can be secured as the reward of labor. When prices are high, money wages may be high though real wages may be low.

General wages depend on general employment and on general efficiency.

Real wages are greatest in the most advanced communities, where the efficiency of labor is greatest. Efficiency depends upon (1) the skill of the workers, (2) their physical strength, (3) their health, (4) their intelligence, (5) their education, and (6) their moral qualities, such as temperance, honesty, persistency, courage, and the like. Efficient labor is more productive than inefficient; and the larger the output or product of the workers, the more can be paid as wages. General employment increases real wages for the same reason that efficiency increases it. Both increase the amount of goods in the world. What has been said so far applies to general wages.

Particular wages depend on the law of supply and demand.

The wages in a particular kind of labor will depend upon the supply of laborers and the demand for them. There are certain kinds of labor that can be done only by highly efficient workers. The supply of highly efficient workers is strictly limited. As a result captains of industry, great professional men, great singers, and artists who enjoy a monopoly of talent receive wages vastly in excess of the average man's. The supply of moderately efficient workers is less limited; these enjoy a moderate income. The unskilled and unreliable men, those with only physical strength to offer, must in hard times compete with the whole body of unemployed; and in consequence their income is a precarious one, and usually small as well as uncertain.

How the supply is determined.

The labor unions by limiting artificially the supply of workers in a given trade secure increased wages in that trade. If it is difficult to enter any

occupation because of the amount of preparation necessary, or for any other reason, there will be a smaller supply of labor, and wages will be high. If the work is disagreeable, or held in low social esteem, or if it is uncertain as to financial success, the competition of workers within it will be less keen, and the wages correspondingly higher. It should be the concern of every young man to find some occupation in which his own superior skill will bring him comparative freedom from competition and increased earning capacity as a result. Men of weak mental and social power cannot hope to compete with those endowed by nature and training. Given equal physical strength and technical skill, the man who can make friends will outstrip the man who lacks the social qualities; and the man who can think hard will outstrip the man who lacks thought power and concentration.

INITIATIVE

Initiative is another prime requisite to high earning capacity. The great danger in acquiring the knowledge and training of our schools is that they may fail to develop initiative.

It may be possible for one to receive an excellent education, so far as mere school learning goes, and still be quite unfitted to fill any place of importance, or to do anything large for himself or for others in the world outside. Not all the talk one hears about the impracticability and incompetence of many who have gone through the educational mill is altogether without foundation in fact. One can be a fairly

Why some
great men
fail in class
work as
students.

good success in school and an utter failure out of it; on the other hand there have been many who were counted failures in college who succeeded beyond expectation in active life. Even in the world of letters there is a long list of men — including Burke, Goldsmith, Shelley, Spencer, and Byron — who were more or less unsuccessful so far as class work in college was concerned. On the other hand, probably every college professor can recall not a few persons who did good and faithful work day after day in his classes, who were never conspicuous for great success in later life. It is said that men are sometimes found in the back rooms of lawyers' offices, preparing briefs at \$50 a month, who know more law than the heads of the firm.

The intel-
lectual
drudge.

The trouble with these persons generally is that they lack personal initiative. In school and college they are intellectual drudges. They have no motive power within themselves. They accept the tasks that others assign; they have never learned to direct their own activities. The slaves of others, they never know the joy of working for themselves.

There were two students in college at one time who were roommates, taking the same course. One has since risen to an important executive position, the other has never been heard from. Let us call them Jones and Jennings. One day Jones was committing to memory one of Horace's Odes, when Jennings happened to observe what he was doing.

"Why, what are you learning that for? We didn't have to commit anything to memory!"

Another time Jones was taking notes from a certain book on economics shortly before the recitation in that subject. Jennings was frightened; he was afraid he had not taken down all of the assignment in class.

"Did Clark assign any work in that book?"

"No."

"Then what in the name of sense are you taking notes from it for?"

"Can't I do anything unless somebody tells me to do it?" was the reply of the young man destined to future distinction.

Jennings was a perfect type of what I should call the intellectual drudge. He made good in nearly every recitation; but he never read beyond the lesson assigned. If no lesson was given out he was of course idle. So long as there was a task-master he was at his task; but of personal initiative he had absolutely none. I suspect that the reason he never did much of anything after he graduated was that he failed to find anyone to assign more work for him to do and give him a mark for doing it. The reason such geniuses as Burke and Spencer sometimes prove mediocre students in their classes is that they are so full of projects of their own which they are working out that they are likely to neglect the classroom work.

Now it is personal initiative, above all, that is the quality demanded for success in the higher positions of active life; and this quality the schools frequently fail to bring out. There is discipline in patient, passive obedience; it is valuable in our

industrial systems where purely mechanical work is required. The graduate of a primary or grammar school, who has merely learned to sit still all day and do as he is told, makes a better machine hand, of course, than the unrestrained savage would make. But the higher the grade of labor to which he rises, the more the workman is called upon to find tasks for himself—to use his own motive force. In executive work success always depends in greatest measure on personal initiative.

An instance
of the value
of initiative.

Of course this initiative may be developed in activities outside of books. Sometimes the young man is fortunate whose pecuniary circumstances are such as to throw him on his own resources during the college course. I have in mind an old classmate who made a remarkable success in a financial way as a mining engineer. He worked his way through college; and his success in later life was wholly due to personal initiative. After a course in engineering, he began as stenographer for a mining expert. While engaged in this work he became interested in a mine then in litigation. He copied on the typewriter the legal papers concerning it. He had previously examined the mine, and he now got permission to make tests and a report after the manner of an expert mining engineer. His figures proved of the greatest importance to his employer, and he was at once promoted. Later, on his own initiative, he discovered and exposed a salted mine, one in which gold dust and nuggets had been put to deceive buyers. By this initiative he protected an English syndicate from fraud. The

syndicate sent him at a considerable salary to take charge of mines in Australia. There, without orders, he set himself the task of examining the properties near by, and whenever he found them valuable he cabled the syndicate advising immediate purchase. In each case his judgment was followed, to the great profit of his employers and to his own personal advancement. The last time I saw him he was on his way from San Francisco to purchase and take charge of mining properties in China, with a salary of \$30,000 a year and a share in the profits.

What is true of the value of initiative in executive work along industrial lines is no less true in professional careers: the author, poet, artist, minister, lawyer, and physician must be his own task-master in every case. Somehow each must have learned to work for himself.

The intellectual drudge not only fails to develop initiative, but he fails also to get from his work the joy and gladness of ultimate triumph. His work is that of the slave rather than that of the free man. His heart is not in it. He does not really know what he is working for. He has his eye on the pass-mark and the diploma, when it should be on the eternal beauty and utility of knowledge. All honor to those self-made men, the Lincolns and others, who have seen the weakness of the unlearned, the strength of the wise, and with none to set tasks but their own strong wills, have climbed to the heights of true culture.

Working
with a will.

But how then, some one asks, will you have us learn? In school lessons are assigned; the class

Initiative in
learning a
language.

must keep step. Besides, teachers are valuable helpers and few students have the strength of will to work alone. Is it not better to go to school? In reply to such questions I would answer, Go to school by all means. But be a live student, not an intellectual drudge. The former has in view the ultimate end, the final mastery and use of a subject; the latter sees only the daily task. The student who is developing power of initiative determines, for instance, to master a language. He wants the art of reading and conversing in another tongue; and the sooner he can get that power the better he likes it. The lesson assigned — so many pages of grammar and text, so many minutes in recitation — is not enough for him. He sets himself to commit passages; he reads aloud; he practices on his fellow students whenever he gets the chance. He keeps up the work in spare hours during vacation. He tries to meet and talk with natives. All this requires initiative, which is the father of executive force.

In learning
mathema-
tics.

I knew a young man who wanted all the power that comes from a thorough knowledge of mathematics. "Why," said he to me one day, "a man can become famous by discovering mathematical laws. Mathematics is such a valuable study." He hunted for original proofs in geometry, sought practical problems in which to apply the principles of algebra, and I once saw him with a quadrant going about to measure the heights of buildings and chimneys.

Another student became so much interested in

electrical phenomena that he could scarcely take time to sleep. He wound a large coil and experimented with the X-ray and wireless when these wonders were new to the world. Today he is a manufacturer of coils and other electrical supplies.

In learning
a science.

Another student was all afire over chemistry. He read books on the application of chemistry to industry. Of course his college work meant something to him, for there was purpose in it. Today he is working to apply his knowledge of chemistry in the manufacture of dye-stuffs from coal-tar products. If he succeeds, there is the possibility that he may open factories now closed for want of dyes, and enrich his country with a new and independent industry.

Few if any large measures looking to the betterment of mankind are being developed in autocracies. Great achievements must be initiated and wrought to accomplishment in an atmosphere of freedom. Consider what free America has done in sanitation, medicine, and industry: there are the cotton gin, the steamboat, the telephone, the telegraph, the graphophone, the harvester, the aeroplane, the rubber industry, the modern steel industry, the sewing-machine, machinery for making shoes, the typewriter, and the science of bridge-building, — all results of American study and enterprise, the gifts of a free country.

Freedom
the source
of great
achievements.

It is in the spirit of freedom that school work should be done. The school that does not inspire but drives its pupils to their tasks will likely further no strong initiative, certainly no thorough original per-

The free
student is
the one with
a purpose.

formance. It will turn out time-servers and underlings, not great men and women. But where students push forward in their work, self-impelled; advised and directed, but not forced; working for themselves, not for the teacher; and, because they want to learn, not because they are compelled by the will of another, — there abides hope for the advancement of the nation and the race.

Final word. The trouble with the intellectual drudge is this: long ago, perhaps in the primary school, he got the habit of accepting exterior authority in the assignment of tasks, — he went to work for the teacher, and he has never set up for himself. This book is written with the hope that some students who read it will thereby develop initiative, will get purposes of their own, will set up in business for themselves in the matter of study. If any considerable number of those who read it are helped to get into right relations with their work, the book will have fulfilled its mission.

APPENDIX A

SOME STATISTICS ON THE ECONOMIC VALUE OF EDUCATION

I. *Effect of Scientific Agriculture in Germany*¹

In thirty years crop production per acre has increased

Rye.....	87.2 %	Barley.....	60.8 %
Wheat.....	88.5 %	Oats.....	85.8 %
Potatoes.....	80.8 %		

This yield would have increased American crops in 1907 to \$1,400,000,000 more than they were worth.

II. *Education and Farm Incomes in Tompkins County, N. Y.*

YEAR'S RETURNS ON LABOR

Owners with common school education.....	\$318.00
Owners with high school education.....	\$662.00
Owners with college education.....	\$847.00
High school education = 5 % bond for.....	\$5000.00

III. *College Education and Incomes of Professional Men*

		Estimated Average College Graduate	Not College Graduate
Lawyers....	\$500 to \$150,000	\$1500	\$800
Physicians.....	500 to 150,000	\$1200	\$750
Dentists.....	500 to 20,000	\$2500	\$1500
Teachers.....	400 to 10,000	\$1200	\$900

¹ *The Past and Future of Education*, John H. Gray.

IV. *A Study of Noted Americans from "Who's Who in America"*

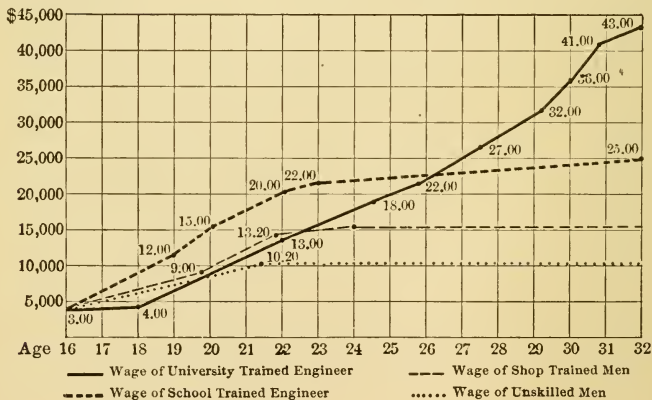
Without education	0
With common school education.....	1368
With high school education.....	1627
With college education.....	7709

Without education.....	No chance to become noted.
With common school education.....	One chance in 9000.
With high school education.....	One chance in 450.
With college education	One chance in 42.

V. *The Money Value of Technical Training*

CAPITALIZED WAGE

CURVE OF WEEKLY WAGE AT VARIOUS AGES



¹ *Transactions of the American Society of Mechanical Engineers*, Vol. xxv.

VI. *Money Value of High School Education, as Shown by Massachusetts Boys*¹

Report of State Board of Education

	Average First Year Per Week	Wages at 25 Years. Per Week
Left School at 14.	\$4.00	\$12.75
Left School at 18.	10.00	31.00

TOTAL EARNINGS

Boy with common school education, 12 years' work . . .	\$5722.50
Boy with high school education, 8 years' work.	\$7377.50

VII. *Summary of Civil Service Employees in the County of Erie for 1913*²

	Number con- sidered	Aver. Yearly Wages
Unskilled workers.	655	\$729
Workers with special training.	82	1618
Technically trained men.	306	1948

VIII. *Special Schooling for Skilled Trades Shown by Records for 1914 of Graduates from Williamson School of Mechanic Trades*³

AVERAGE INCOMES

73 in business for themselves.	\$2848.20
172 salaried executives each.	1890.20
293 in skilled trades.	1072.05
51 teachers in trade schools.	1349.09

¹ *Journal of Education*, Sept. 14, 1911.

² From Weaver's *Profitable Vocation for Boys*, p. 40.

³ *Ibid.*, p. 38.

APPENDIX B

LIST OF BOOKS ON VOCATIONS

- Baker, A. M., *How to Succeed as a Stenographer or Typewriter*.
Fowler and Wells.
- Beveridge, A. J., *The Young Man and the World*. Appleton.
1905.
- Bigelow, W. D., *Chemical Positions in the Government Service*.
Science. 1908.
- Bird, T. A., *Sales Plans*. 1910.
- Blythe, S. G., *Making of a Newspaper Man*. Altemus. 1912.
- Boston Vocational Bureau, *The Department Store*. 1912.
- Boston Vocational Bureau, *The Banker*.
- Boston Vocational Bureau, *Law as a Vocation*.
- Browne, Edith A., *Peeps into Industries*. 1912.
- Burnham, W. P., *Three Roads to a Commission in the Army*.
Appleton. 1893.
- Carr, C. E., *The Railway Mail Service*. McClure. 1909.
- Carrere, J. M., *Architecture as a Profession*. Cosmopolitan.
35: 488.
- Carson, H. N., *The Romance of Steel*. Barnes. 1907.
- Cherrington, P. T., *Advertising as a Business Force*. Double-
day. 1913.
- Clark, T. M., *Building Superintendence*. Macmillan. 1913.
\$3.00.
- Collins, H. J., *The Art of Handling Men*. Altemus. 1910.
- Corbion, W. A., *Principles of Salesmanship*. Jacobs. 1907.
- Craig, J. A., *Sheep Farming in North America*. Macmillan.
1913.
- Dooley, W. H., *Textiles*. Heath. 1912. \$1.10.
- Duncan, Robt. K., *Chemistry of Commerce*. Harper. 1907.
\$2.00.
- Eaton, Walter P., *The American State To-day*. Small. \$1.50.

- Eckles, C. H., *Dairy Cattle and Milk Production*. Macmillan. 1911. \$1.60.
- Edgar, Wm. C., *Story of a Grain of Wheat*. Appleton. 1904.
- Esenwein, J. Berg, *Writing the Short Story*. Hinds and Noble. 1909.
- Egan, J. O., *Labor and the Railroads*. Houghton. 1909. \$1.00.
- Foltz, E. B. K., *Federal Civil Service as a Career*. Putnam. 1909. \$1.50.
- Gage, F. W., *Modern Press Work*. Inland Printer. 1908.
- Gibson, Chas. R., *Electricity of To-day*. London. 1907.
- Given, J. L., *Making of a Newspaper*. Holt. 1907.
- Hall, S. R., *How to Get a Position and How to Keep it*. Funk and Wagnalls. 1908. \$.50.
- Harrington, Frank, *How to Make a Studio Pay*. Wilson. 1914.
- Harris, A. M., *Letters to a Young Lawyer*. West Publishing Co., St. Paul.
- Hitchcock, Fred H., *The Building of a Book*. Hitchcock. 1906. \$2.00.
- Hoyt, A. S., *The Preacher*. McClurg. 1911. \$1.75.
- Hungerford, *The Modern Railroad*. Macmillan. 1909. \$1.50.
- Husband, Joseph, *A Year in a Coal Mine*. Houghton. 1911. \$1.10.
- Johnson, C. N., *Success in Dental Practice*. Lippincott. 1913.
- Lagnac, Albert, *Musical Education*. Appleton.
- Low, W. H., *A Painter's Progress*. Scribner.
- Marden, O. S., *Choosing a Career*. Bobbs-Merrill. 1905.
- Mathew, J. McC., *How to Succeed in the Practice of Medicine*. Saunders. 1905.
- Monroe, J. P., *New Demand of Education*. Doubleday. 1912.
- Nelson, S. A., *How to Get Admission to West Point*. 1898.
- Palmer, G. H., *The Ideal Teacher*. Houghton. 1910.
- Powell, E. P., *Orchard and Fruit Gardens*. Doubleday. 1908. \$1.10.
- Reid, Wm. A., *The Young Man's Chances in Central and South America*. Washington. 1914.
- Shaw, Albert, *The Outlook for the Average Man*. Macmillan. 1907.

- Small, Sydney, *How to Become a Successful Motorman*. Drake. 1908. 2 of 2
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- Smith, J. Russell, *The Ocean Carrier*. Putnam. 1908. \$1.50.
- Stearns, G. F., *Medicine as a Profession*. Cosmopolitan. Apr., 1913.
- Stevens, Chas. McC., *Complete Civil Service Manual*. Hinds. 1902.
- Stockwell, H. G., *Essential Elements of a Business Character*. Revell. 1911. \$.60.
- U. S. Civil Service Commission, *Manual of Examinations*. Free.
- Weaver, E. W., *Profitable Vocations for Boys*. Barnes.
- Weaver, E. W., *Profitable Vocations for Girls*. Barnes. 1915.
- Whittingham, H., *That Farm*. Doubleday. 1914. \$1.20.
- Williams, A., *Wonders of Mechanical Ingenuity*. Lippincott. 1910.

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